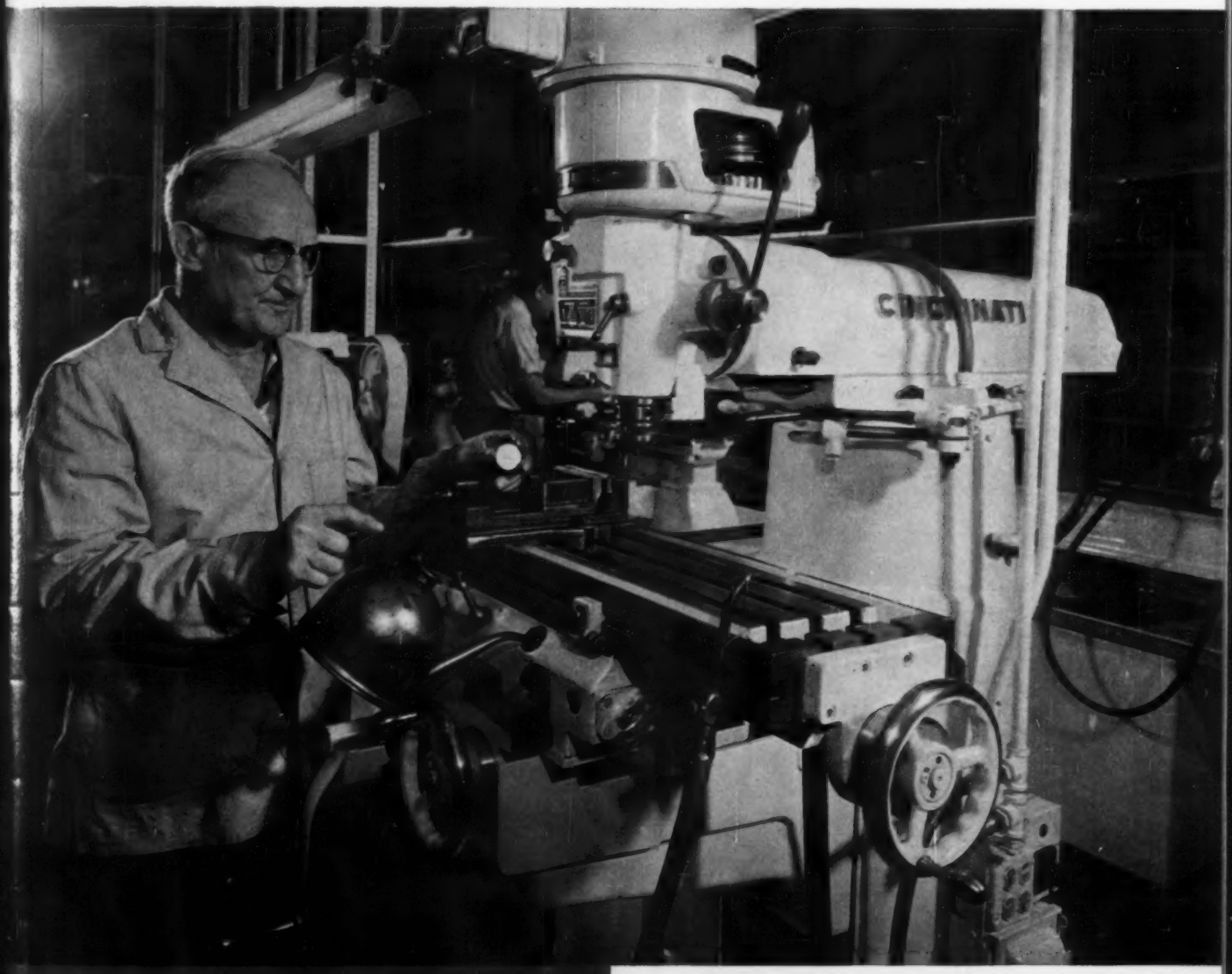
The IRON AGE

August 20, 1959 A Chilton Publication The National Metalworking Weekly



Special Report to Management—

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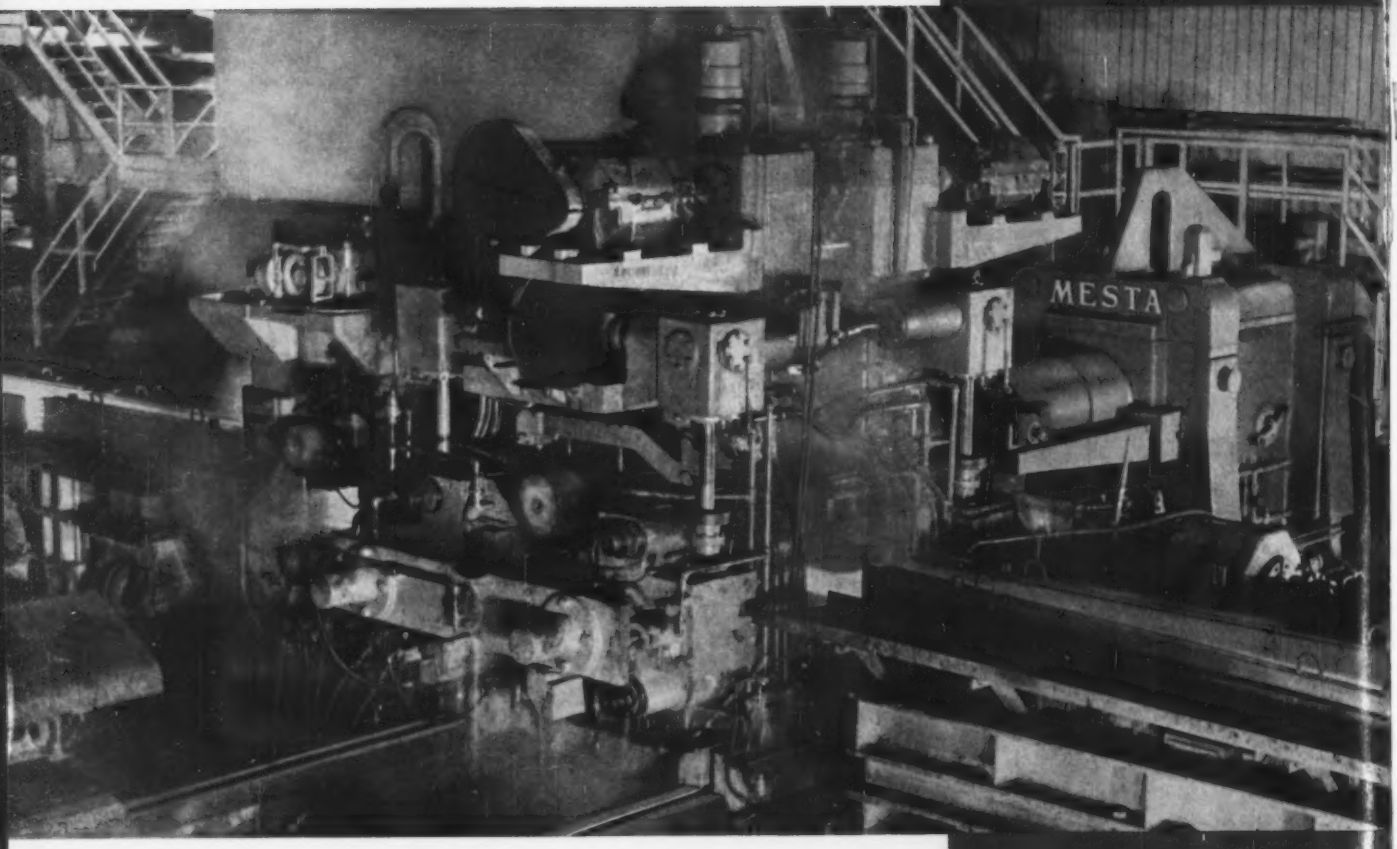
Where Steel Shortages Are Cropping Up – P. 91

New Small Trucks Handle Spot Plant Jobs – P. 94

Digest of the Week – P. 2-3



WIDE FLANGE BEAM AND STRUCTURAL MILLS

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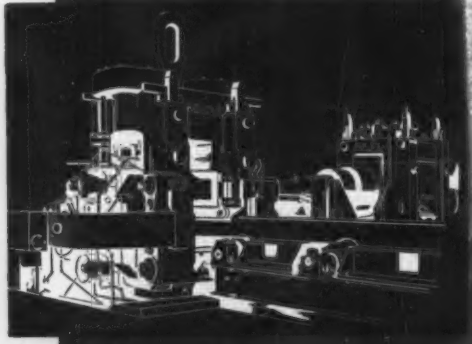
MESTA



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PITTSBURGH, PENNSYLVANIA

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor, Bethlehem Steel Export Corporation

now...Lehigh H leads the field in machinability

As the result of its special annealed structure, developed and tested over a period of several years, Bethlehem's Lehigh H tool steel (AISI Type D-2) now leads the field in machinability among the high-carbon, high-chrome tool steels sold today. In impartial studies, the machinability of Lehigh H has been proved outstanding as a most economical grade for a wide range of difficult applications.

In addition to its better machinability, Lehigh H now has improved wear-resistance, because its vanadium content has been increased to 1 pct. Other important advantages of Lehigh H: improved carbide distribution and increased center density, based on U. S. Patent No. 2,809,109, issued to Bethlehem. Its uniform structure makes possible a better response to heat-treatment, and results in maximum service life for tools and dies, even in the most severe service.

Lehigh H is the D-2 type of air-hardening high-carbon, high-chromium tool steel, which is well known for minimum dimensional change in heat-treatment. For tops in machinability, and for all-around dependability and economy, be sure to order the new improved Lehigh H from your Bethlehem tool steel distributor.

THE IRON AGE
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The IRON AGE

August 20, 1959—Vol. 184, No. 8

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STEEL STRIKE

T-H Likely?—It will take some drastic measure to break the steel stalemate. Both sides are completely boxed in. But Taft-Hartley is not wanted by the union, management, or the President. P. 93

SMALL TRUCKS

Doing Big Jobs—Small trucks, cousins of the golf cart, are working

their way into the shop. Jobs range from small fire trucks to delivery of small parts. Leasing may be a major development. P. 94

LABOR REFORM

Action By Congress—House passage of the Landrum-Griffin bill

Metalworking

◀ COVER FEATURE

LUBRICATE PROPERLY: Every metalworking plant buys lubricants to keep vital machinery running. Wise use of these lubricants eliminates costly downtime. This week's special report shows how to set up a planned lubrication system. (Judson Mfg. Co. photo.) P. 125

brings labor reform closer. P. 95

PROBLEM EMPLOYEES

Management's Duty—There are limits to management's obligation to problem employees. Those who can be helped deserve it. But those who are beyond reasoning, or who may be destructive to the company, may have to be separated. P. 103

FEATURE ARTICLE

HOW TO GET MORE FOR YOUR LUBRICATION DOLLAR

Plan a Program—The only way to get the most for your lubrication dollar is to set up a system of planned lubrication for your machinery. It's not difficult. It's just a matter of getting the right quantity of the right lubricant to the right place at the right time. P. 126

Consult an Authority—No plant is so small that it can't put one man in full charge of its planned lubrication program. If your annual budget for production maintenance is $100,000 or more, you can profit by having a lubrication engineer on your payroll. P. 129

Buy Wisely—You can't run your plant with one universal lubricant. Nor should you buy every type recommended. Here's how to strike the right balance between economy and suitability. It's up to your own lubrication specialist to select the fewest possible types and grades of lubricants to suit your equipment. P. 131

Keep Them Clean—Proper handling, storage, and dispensing of lubricants are important phases of your planned program. And it's your job to see that they stay clean and free from deterioration from the time you receive them until they are applied. P. 135

Human Element—The finest lubricants you can buy only represent potential benefits until they're applied to moving machine parts. You can't afford to miss on the all-important application job. P. 138

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About As Expected—The military is making up its shopping lists. They got about what they asked in total funds but there are some changes in projects made by Congress. More spending for research and development approved. P. 96

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Not Any More—The new head of the Commerce Dept., Frederick Mueller has served notice he isn't going to ease the restrictions against trade with Russia. P. 111

MACHINE TOOLS

Builders Optimistic—E. P. Bullard III tells his stockholders the road back to 1956-57 prosperity will be long and hard, but that they are finally on the way. P. 115

STEEL SUMMARY

Inventory Policies — It's been tried before, but the industry is hearing a lot about close inventory policies after the strike. Big users believe that capacity is now equal to any emergency and want to operate with low inventories. P. 165

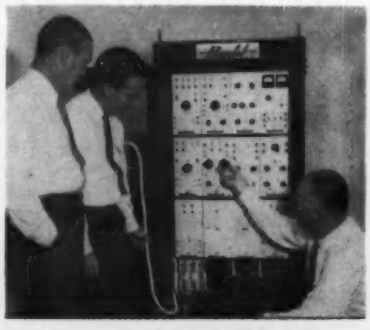
BUYING PREDICTIONS

Optimism from Alcoa — Tom English, general PA for Alcoa, sees signs the price spiral may be ending. He also foresees a period of ample supplies, reasonable prices and good delivery. P. 166

NEXT WEEK

MODERN MARKETING

Planning a New Product?—First of a new series on the marketing concept tells how The Budd Co. geared all management functions to introduction of a new welding control. Others will cover prospect lists, 'target accounts,' data processing.



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The word is out about the most complete, integrated line of control relays available today.

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No time-saving production short cuts are worth sacrificing this quality, even in the face of the tremendous demand created by customer preference. In fact, we're sure our customers wouldn't have it any other way.

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PHOTO BY KARSH OF OTTAWA

"We can depend on Sharon for steel of consistent quality"

—CHARLES MacINTOSH, Supt. of Assembly, Smith-Erie Div., A. O. Smith Corp.

"We've found Sharon Steel meets specs—then holds to them," says Charles MacIntosh, Superintendent of Assembly at A. O. Smith's Erie Division. "That's probably the most important single consideration to those of us responsible for fabrication," MacIntosh continues.

Shown here with Harold L. Ripley, Supt. of Machine Shop, MacIntosh examines a stainless steel stamping—a part for A. O. Smith's new line of ultra-modern gasoline pumps. He concludes, "For finish, too, it's hard to beat stainless from the *Sharon Steel Corporation, Sharon, Pa.*"

SHARONSTEEL

SHARON *Quality* **STEEL**

Steelworkers' Crisis: It Has Itself To Blame

There is too much shouting and fussing around in the steel labor hassle. Steel firms are being criticised by the union for making a profit. This won't go down well with the millions of stockholders in the nation.

While each side in the dispute vies with the other in telling the public the facts, let's take a look at the union's plight.

The Steelworkers have had a big deal in every year since they started business in 1937. It doesn't make much difference who helped them out. They managed to call the shots.

Maybe at one time they had a lot of legitimate gripes. Steel leaders will admit that workers were entitled to much of what they got in improved wages and fringes. True, the union was in there plugging for it, calling strikes and getting Washington into the act.

But the deals went on and on and on. It got to be a real snap. The union would demand a big package without naming the cost. Both sides would glare at each other. Finally the steel firms would name a figure and the steel union would reject it. Then the bargaining "upward" began. And just as often it was finished in the White House.

Each time the steel pattern was set, it was imposed by the Steelworkers on hundreds of other firms in the metalworking field.

Well, the end of the rope is here. Taking big losses to plant and equipment and running the risk of bitter industrial relations for years, the steel industry took its stand. No matter what the union calls it, and no matter what the outcome, the steel industry knows it can never again go along with a big annual wing-ding wage-price go-around.

The public knows this; the steel workers know it; and the customers know it. About the only ones who don't know it—or won't admit they know it—are steel union leaders.

But they had better climb on the bandwagon. The ordinary people—most of whom are not in the high-paid brackets—have decided big wage hikes bring nothing but higher prices.

If the union keeps insisting on getting something big every year, it will wreck itself—not the steel firms.

Now is the time for Dave McDonald to really take stock of what the big picture is in the nation today.

Tomorrow may be a little too late!

Tom Campbell

Editor-in-Chief

N/D CASE HISTORIES

Exclusive Sentri-Seals effectively seal out foreign materials at temps up to 225° F for extended periods — up to 350° F for shorter periods. Made of Buna-N, they are compatible with silicone, petroleum and diester lubricants.

Photo courtesy: Thor Power Tool Company

N/D Bearings Seal Out Abrasives...Allow Cool Operation In 21,600 R.P.M. Grinder!

CUSTOMER PROBLEM:
Tool manufacturer requires bearing design that will seal 21,600 r.p.m. grinder from abrasives . . . yet heat must be minimized for operator comfort since tool is hand held.

SOLUTION:
N/D Sales Engineer recommended a group of four New Departure integrally enclosed bearings . . . some with Sentri-Seals. These precision ball bearings successfully shut out microscopic grinding abrasives. And, even with such positive sealing, the virtually friction-free New Departures help keep the temperature low enough for comfortable hand operation. They're sealed and lubricated for life . . . promising trouble-free ball bearing performance without the added burden of periodic maintenance.

For immediate analysis of your current ball bearing problems, call the New Departure Sales Engineer in your area or write Dept. S-8.

Replacement ball bearings available through United Motors System and its Independent Bearing Distributors

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Rough-Faced Tools Do Best?

Research on metal stamping by West German engineers has turned up a piece of information which goes contrary to American thinking. Their slip-zone studies show that rough-faced tools do best. Such punches give a cleaner cut with less marking of material, they say.

Direct Reading Strain Gage

A new self-contained strain sensitive device uses the photostress technique. Developed by Tatnall Measuring Systems Co., it's a small rectangular piece of plastic mirrored on one side and covered with a polarizing material on the other. The gage is bonded to the structure which is to be loaded. For every strain level color fringes in the gage assume a position on the graduated scale.

High-Strength Titanium

A recent government research report reveals that a new type titanium alloy, Ti-3V-11Cr-3A1, can be heat treated to such high strength levels that new target properties had to be specified for it.

Stainless Foil Demands

Aircraft builders and defense officials are concerned over shortage of capacity for rolling stainless foil for honeycomb structures in aircraft. Capacity is now only about a quarter of what would be necessary under proposed aircraft construction schedules. Techniques for rolling are tricky and sendzimir mills expensive. Producers of the foil are reluctant to expand without firm orders, but are getting plans laid for a sudden expansion.

Additive for Clean Burning

A new-type additive for diesel oil, fuel oil and kerosene has passed months of laboratory and field testing. Used in the ratio of 1 to 500, the product improves combustion, reduces hard-carbon deposit, eliminates condensation and inhibits corrosion. Its use eliminates a large portion of smoke and air pollution, and may be key to smog elimination.

Metallize Wood Patterns

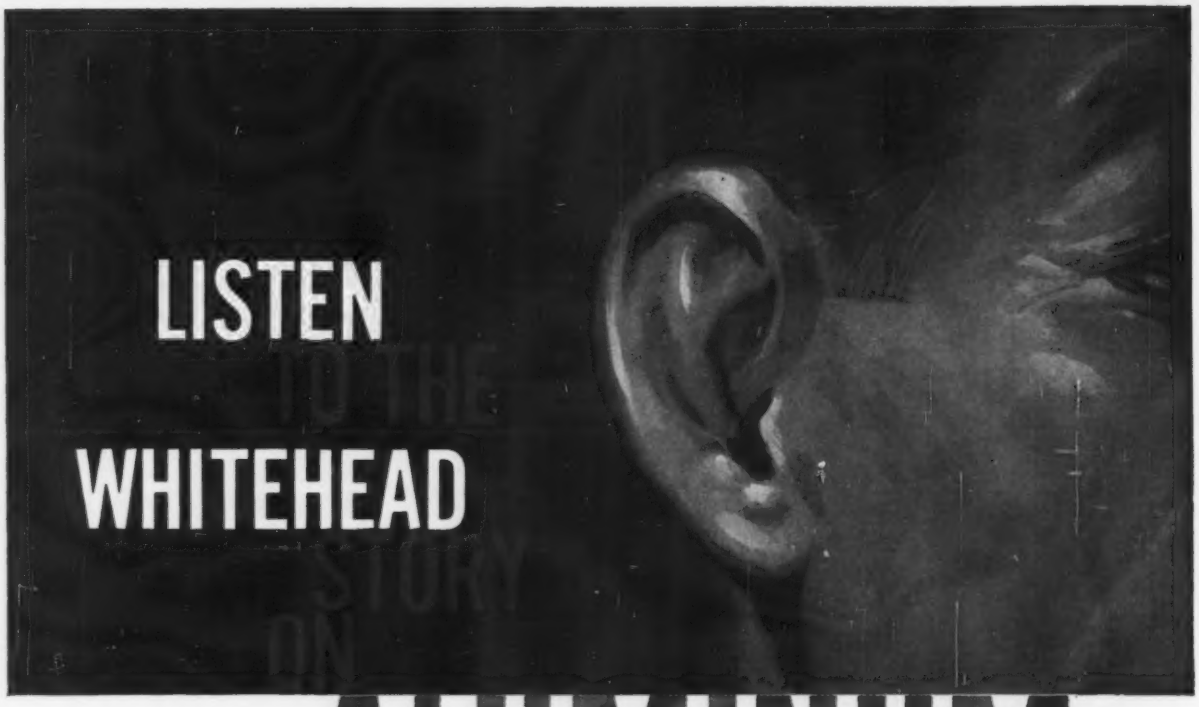
A method of metallizing wooden patterns and core boxes increases their life considerably. The surface to be coated is first sandpapered. Then a low melting point metal (tin, lead, zinc or aluminum) is sprayed on. Coatings of harder metals can also be applied, if a soft metal base is sprayed on first.

Vacuum Melting Expansion

Vacuum melting may be ready for an important market breakthrough. One equipment maker reports advanced negotiations on vacuum arc furnaces totaling about $3 million. In this group furnaces are being considered for stainless, forging and aircraft structural grades as well as for tool steel and super alloys.

Start A-Plane in Fiscal 1960

The U. S. may begin design and construction of a nuclear-powered plane in the current fiscal year. Many congressmen and military leaders favor starting now on a test plane, without waiting for engine and airframe performance which will meet military requirements. Continued delay will cost more and waste time, they say. It's evident the new military budget has enough "flexible" funds to get work underway.



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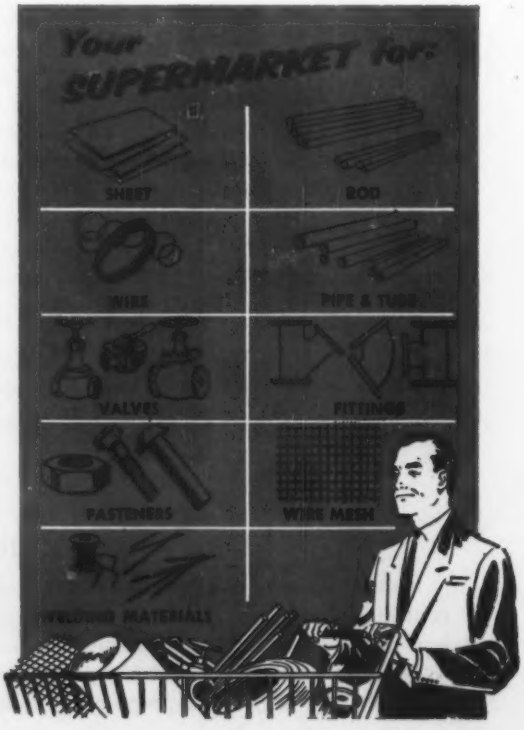


LETTERS FROM READERS

Problem Workers

Sir—The article in your Aug. 6 issue "Why Management Has Difficulty Handling Problem Employees" is very interesting and intriguing. It seems to me to be the most realistic analysis of problem employees I have seen.

I would appreciate very much receiving a copy of the article (a couple, if you have them to spare). Needless to say, I also would like a copy of the follow-up article, "Remedial Action," when it is available.—R. E. Davis, Mfg. Mfr., Aircraft Equipment Dept., Westinghouse Electric Corp., Lima, O.

Sir — "Why Management Has Difficulty Handling Problem Employees," by Robert N. McMurry, was extremely interesting. I very much want to use this and the other two parts of the series in supervisors' meetings.

Would it be possible for you to send 25 copies of each article in the series?

Again, my congratulations for a fine article on an extremely provocative subject — George Elmore, General Superintendent, American Screw Co., Willimantic, Conn.

Sir—Please forward to us six copies of Dr. McMurry's article.—D. B. Mancke, Office Manager, Bethlehem Steel Co., Bethlehem, Pa.

▪ **Part II of Dr. McMurry's article, "How to Handle Different Kinds of Problem Employees," appeared in the Aug. 13 issue. Part III, "Management's Obligation to Its Problem Employees" appear in this issue on page 103.**

Within a week after publication of the first article almost 500 reprints had been requested. Many readers also asked for copies of the succeeding articles. Reprint requests are now being processed.—Ed.

Profits and Pride

Sir—I read with interest your editorial "Substantial Profits: Something To Be Proud Of." (Aug. 6).

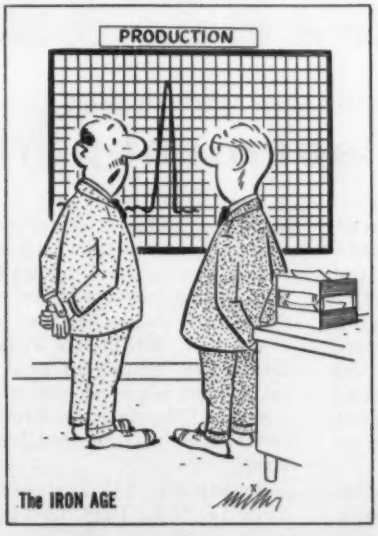
Perhaps I may add my two cents to these many dollars by stating that it may well be that these big profits were made during the first part of the year because of the impending steel strike.

Everyone knows industry stocked up and bought in fact for the whole year. Thus said profits should be spread for a whole year—Rene Mockli, St. Petersburg, Fla.

Parts Inspection

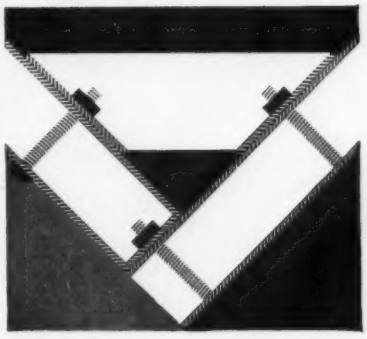
Sir—On page 9 of your July 23 issue you made reference to an electrochemical inspection method for sintered metal parts. Is it possible to obtain further information on this development?—W. McCue, Mgr. of Mfg., Steel Improvement & Forge Co., Cleveland.

▪ **For further information about the item you may contact Publications & Public Information Division, OTS., U. S. Department of Commerce, Washington, D. C.—Ed.**



"Maybe we should have another contest."

IN FASTENERS SOUTHERN IS permanence



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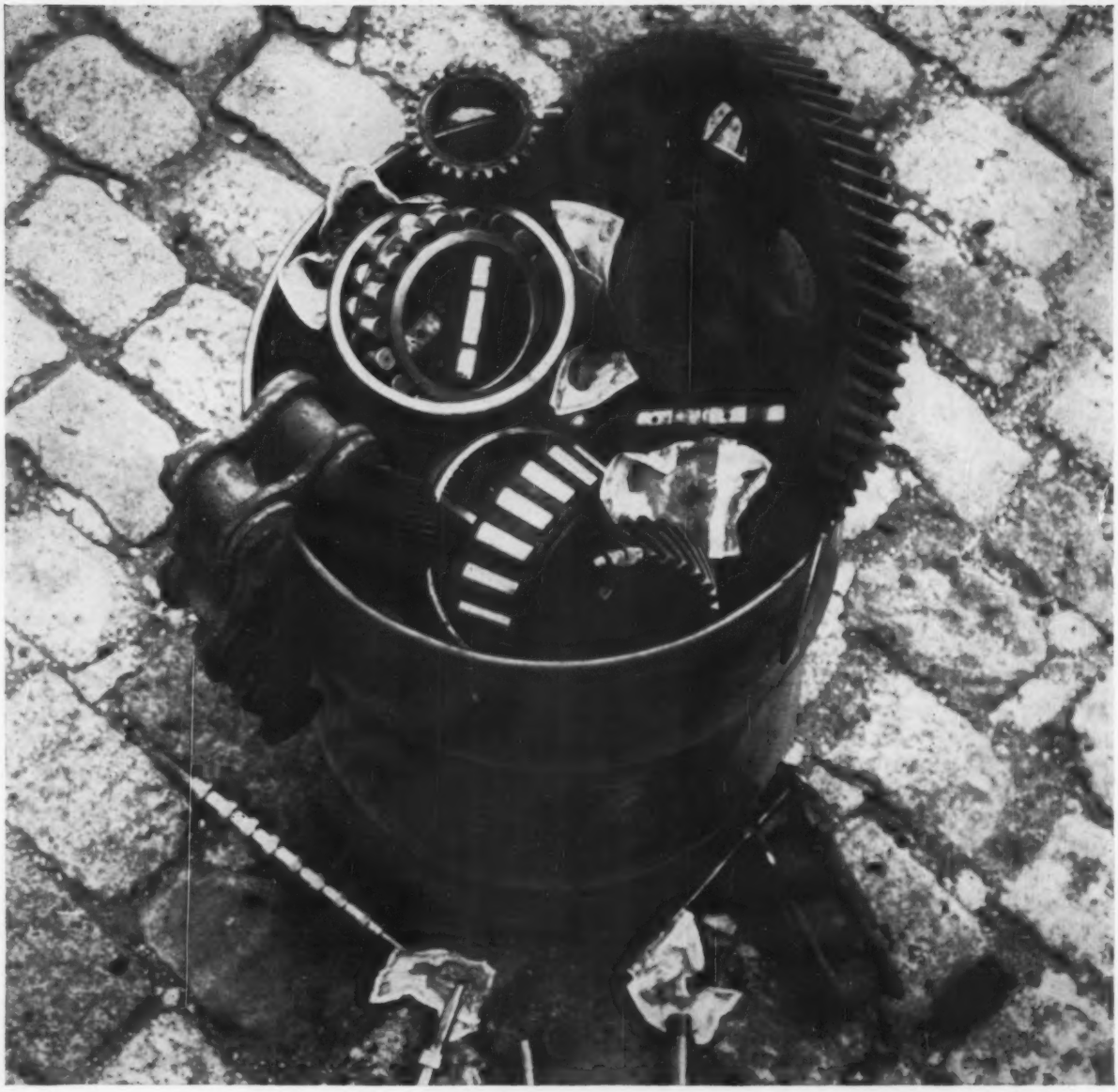


TEXACO ORGANIZED LUBRICATION CAN HELP YOU . . .

End replacement parts waste

One Northeastern manufacturer replaced parts in a major machine every two weeks —a not uncommon practice in industry today. He marked it off as a normal maintenance expense. It wasn't really—it was the result of faulty lubrication practices. A Texaco Lubrication survey spotted the trouble—solved the problem. Now the manufacturer operates with a Texaco Organized Lubrication Plan—and the trouble no longer exists.

Chances are the same thing is happening in your plant right now—It doesn't have to. A Texaco Organized Lubrication Plan can extend parts life significantly—saving thousands of dollars in replacement parts and even more in uninterrupted production for longer periods.

Get full details on Texaco Organized Lubrication from your local Texaco Lubrication Engineer. He can supply you with a copy of "Management Practices that Control Costs via Organized Lubrication." Or write:

Texaco Inc., 135 East 42nd Street, New York 17, N.Y., Dept. IA-110.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

FATIGUE CRACKS

How to Wage War

Here's a new wrinkle on the old irresistible force-immovable object routine.

What happens when a ballistic missile too fast and evasive to be hit is attacked by a guided missile too accurate, with too much electronic homing "instinct" to miss?

Expensive Game — In the old days when a general wanted an answer he cranked up his equipment, put troops in the field, and played a war game. Not anymore —at least not on this problem.

Each of these missiles is worth hundreds of thousands of dollars and you'd have to play the game again and again to get a real result. The answer to this problem as well as many others was disclosed at a recent meeting of the Association of the U. S. Army.

Members are contractors, or would-be contractors, to the U. S. Army. They gathered to talk things over and show their latest wares at the Sheraton Park Hotel in Washington, D. C.

Oh, yes—the answer to the problem. You put your men in the field, assemble the data needed for a fire order—then wheel out a new lightning fast computer. The other side does likewise, and by comparing computer notes you can tell which missile has the muscle.

Capsule Criticisms

The tone of these tongue-in-cheek comments from the Wheeling Steel Corp. on the staff men seem to indicate he can do no right.

But, since no one is perfect, we'll pass them along with the usual warning: Take with a grain of salt.

The Staff Man—If he is usually in the office—he should get out more often.

If he is out when you call—he isn't on the job.

If he is at home nights—he is neglecting outside contacts.

If he isn't at home nights—he is wasting his time on frivolous things.

If he talks on a subject—he's trying to run things.

Is He Silent?—If he is silent—he has lost interest or he has an inferiority complex.

If he agrees with you—he lacks originality or conviction.

If he doesn't agree with you—he is ignorant.

If he is too busy for casual talk —his job has gone to his head.

If he engages in casual talk—that's all he has to do.

If he can't give you an immediate answer—he is incompetent.

If he can give you an immediate answer—he doesn't think things through.

. . . Or Is He Cordial?—If he appears cordial—he is playing politics.

If he appears aloof—he should be trimmed down to size.

If he has a strong opinion—he is bullheaded.

If he tries to see both sides of a question—he is pussyfooting.

If he is on the job a short time—he lacks experience.

"Would you mind snarling into the phone, boss. My wife doesn't believe I'm working late."

Photomicrograph of a cross section of a typical North PVC glove. Notice the extra-thick coating. That's where the wear is!

LESS LINER! MORE GLOVE!

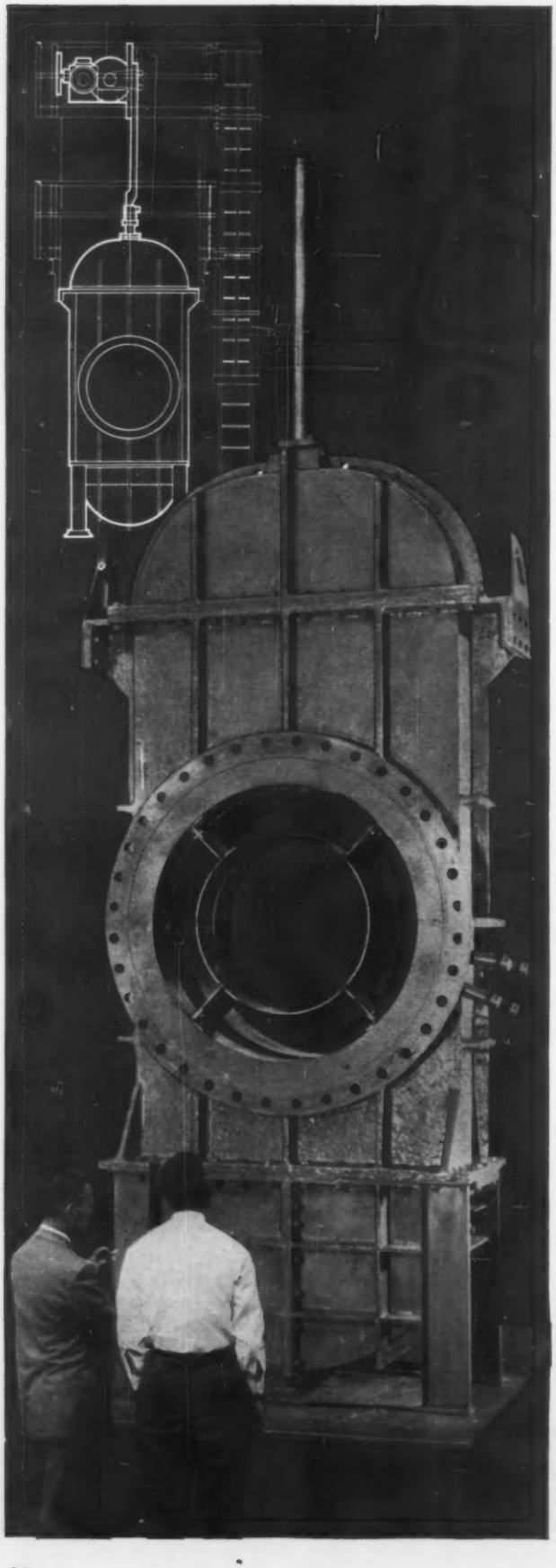
That's why North PVC gloves by Jomac give longer service... better protection!

When you compare gloves, remember this: we use a special lightweight knitted liner and *extra coating*. Some manufacturers use heavy canton flannel liners and *less coating*. Although total weights may be the same, you get a better value with North PVC gloves, because you're paying for gloves . . . not liners! The wear, after all, is in the coating.

And that isn't all! We offer a better selection of sizes . . . and that means greater comfort, greater dexterity, greater productivity for every worker on every job.

FREE OFFER! On your business letterhead, send us complete details of your working conditions, and we will send you a sample pair. Do it today!

JOMAC
INDUSTRIAL GLOVES
Jomac Incorporated, Dept. K, Phila. 38, Pa.
Plants in Philadelphia, Pa., and Warsaw, Ind.
In Canada: Safety Supply Company, Toronto
In Europe: North-Jomac Ltd., London, W1



NEW

fastest way of changing blast furnace stoves

BAILEY

WATER-COOLED GAS BURNER SHUT OFF VALVE

Full Open to Full Closed in 11 Seconds

Valve disc and body are water cooled to prevent overheating while the stove is on blast. Motor-operated drive unit is located on a platform above the valve, well clear of stove heat. This valve is bolted tight to the burner and stove saddle flange, thus preventing leaks at the burner. ***Write for Bulletin GB-100.***

WILLIAM M. BAILEY COMPANY

1221 BANKSVILLE ROAD, PITTSBURGH 16, PA.

COMING EXHIBITS

Instrumentation Show — Sept. 21-25, International Amphitheatre, Chicago. (Instrument Society of America, 313 Sixth Ave., Pittsburgh 22.)

Metal Show — Nov. 2-6, International Amphitheatre, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

MEETINGS

SEPTEMBER

Pressed Metal Institute—Annual meeting, Sept. 13-17, Estes Park, Colorado. Institute headquarters, 3673 Lee Rd., Cleveland.

American Mining Congress—Metal mining-industrial minerals convention, Sept. 14-17, Denver, Colorado, Congress headquarters, 1200 18th St., N. W., Washington, D. C.

American Die Casting Institute—Annual meeting, Sept. 15-18, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

National Petroleum Assn.—Annual meeting, Sept. 16-18, Traymore Hotel, Atlantic City, N. J. Association headquarters, Munsey Bldg., Rm. 958, Washington 4, D. C.

Steel Founders' Society of America—Fall meeting, Sept. 21-22. The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland.

Electronic Industries Assn.—Quarterly meeting, Sept. 22-24, Plaza Hotel, New York. Association headquarters, 1721 DeSales St., N. W., Washington 6, D. C.

Porcelain Enamel Institute, Inc.—Annual meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington 4, D. C.

Association of Iron & Steel Engineers—Convention, Sept. 28-Oct. 1, Sherman Hotel, Chicago. Asso-

(Continued on P. 16)

"FASTER FROM FOSTER" service delivers any kind of pipe ...ANYWHERE

One call to any of Foster's six nationwide warehouses gets you immediate delivery of all the pipe you need, regardless of type, size or specification. L. B. Foster Company has made a specialty of supplying the "hard-to-get" sizes, the unusual walls, the extra large quantities.

Take advantage of "single-source" buying for all of your pipe requirements: Tested and Structural Steel Pipe in all sizes and specifications ⅛" thru 48", Stainless, Seamless Alloy and Pressure Pipe—Aluminum, Wrought Iron and PVC Pipe—complete lines of Valves, Fittings and Flanges.

For "complete package" shipments—for savings in time and money—try "Faster-From-Foster" service. Write, wire or phone your nearest Foster office.

L B FOSTER CO.

Pittsburgh 30, Pa. • New York 7, N.Y. • Chicago 4, Ill.
Houston 2, Texas • Los Angeles 5, Calif. • Atlanta 8, Ga.

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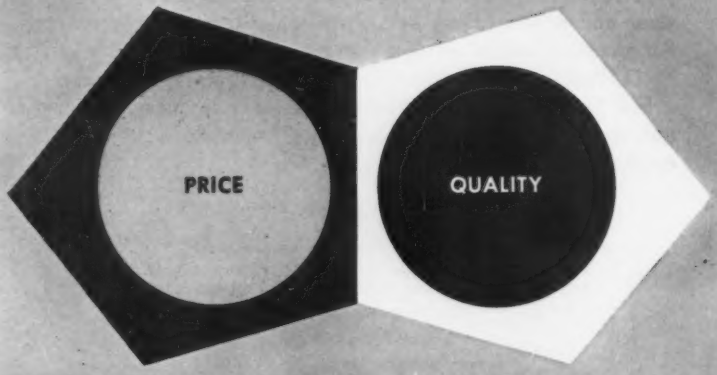
Send for current Pipe Stock List No. IA-8.

WHICH LOOKS BIGGER TO YOU?



— in buying blast cleaning abrasives, too, low price is just an illusion.

It's not the price per ton, but abrasive quality and resultant performance that control your actual blast cleaning costs. Over 950 field tests against lower priced steel abrasives have proven that top quality WHEELABRATOR Steel Shot can cut your abrasive costs as much as 50%! Start saving now with WHEELABRATOR Steel Shot!

WRITE TODAY FOR THIS NEW HANDBOOK
of blast cleaning abrasive performance data, full of charts and facts to help you control abrasive consumption and cleaning costs. *Write to Wheelabrator Corp., 505 South Byrkit St., Mishawaka, Ind.*

WHEELABRATOR
STEEL ABRASIVES

EXHIBITS, MEETINGS

(Continued from P. 15)

ciation headquarters, 1010 Empire Bldg., Pittsburgh.

American Welding Society — National fall meeting, Sept. 28-Oct. 1, Hotel Sheraton-Cadillac, Detroit. Society headquarters, 33 W. 39th St., New York.

OCTOBER

National Assn. of Sheet Metal Distributors — Annual meeting, Oct. 4-7, Atlantic City, N. J. Association headquarters, 1900 Arch St., Philadelphia 3.

Truck Body & Equipment Assn., Inc.—Annual convention and exhibit, Oct. 5-7, Sherman Hotel, Chicago. Association headquarters, 1616 "K" St., N. W., Washington 6, D. C.

American Gas Assn.—Annual convention, Oct. 5-7, Chicago. Association headquarters, 420 Lexington Ave., New York.

Society of Automotive Engineers—National Aeronautic meeting, aircraft manufacturing forum and engineering display, Oct. 5-10, Ambassador Hotel, Los Angeles. Society headquarters, 485 Lexington Ave., New York 17, N. Y.

Gray Iron Founder's Society, Inc.—Annual meeting, Oct. 7-9, Fairmont Hotel, San Francisco, Calif. Society headquarters, 930 National City-E 6th Bldg., Cleveland.

Conveyor Equipment Manufacturers Assn.—Annual meeting, Oct. 10-13, Grand Hotel, Point Clear, Ala. Association headquarters, One Thomas Circle, Washington, D. C.

American Society for Testing Materials—Pacific area national meeting, Oct. 11-16, Sheraton-Palace Hotel, San Francisco, Calif. Society headquarters, 1916 Race St., Philadelphia.

Wire Assn. — Annual convention, Oct. 12-15, Statler Hotel, Cleveland. Association headquarters, 453 Main St., Stamford, Conn.

The Ingersoll Touch...in Specialty Steels

From tapping out a heat to plate and sheet, Ingersoll specialty steels get special attention. Quality is the watchword at every step–to make sure your analysis, size and gauge specifications are exactly met. Ingersoll service is something special, too–with melting and rolling schedules tailored to your requirements. That's the Ingersoll touch–and it costs nothing extra. Try us, and see.

STAINLESS STEELS • HEAT RESISTING STAINLESS • INGACLAD STAINLESS-CLAD SHEETS • ALLOY STEELS
FORGING QUALITY ELECTRIC FURNACE INGOTS TO 23,000 POUNDS • AUTOMOTIVE CLUTCH PLATE STEELS
CROSS-ROLLED STEEL • CARBON ELECTRIC STEEL FOR TRACTOR CLUTCH DISCS • KNIFE STEELS • SAW STEELS
HIGH SPEED HACK SAW STEELS • SOFT CENTER AND OTHER AGRICULTURAL STEELS • SPECIAL ANALYSIS STEELS

INGERSOLL STEEL
B-W
BORG-WARNER

Ingersoll STEEL DIVISION

1884 75 YEARS 1959

Borg-Warner Corporation • NEW CASTLE, INDIANA

Your new plant or expansion idea

Raw materials available?

Right process chosen?

Location correct?

Capacity adequate?

Economically sound?

Readily financed?

Kaiser Engineers designs and builds major facilities for the Steel industry, and is U. S. licensor for the proven L-D Process of oxygen steel making.

Among KE's most valued services are sound, searching economic analyses, feasibility studies and site evaluations. In a word—*Pre-Engineering*—impartial, outside analysis which helps you decide whether to proceed with, defer, or modify the project.

Kaiser Engineers offers you cost-saving, time-saving, one-company service from concept through start-up.

KAISER ENGINEERS

Division of Henry J. Kaiser Company
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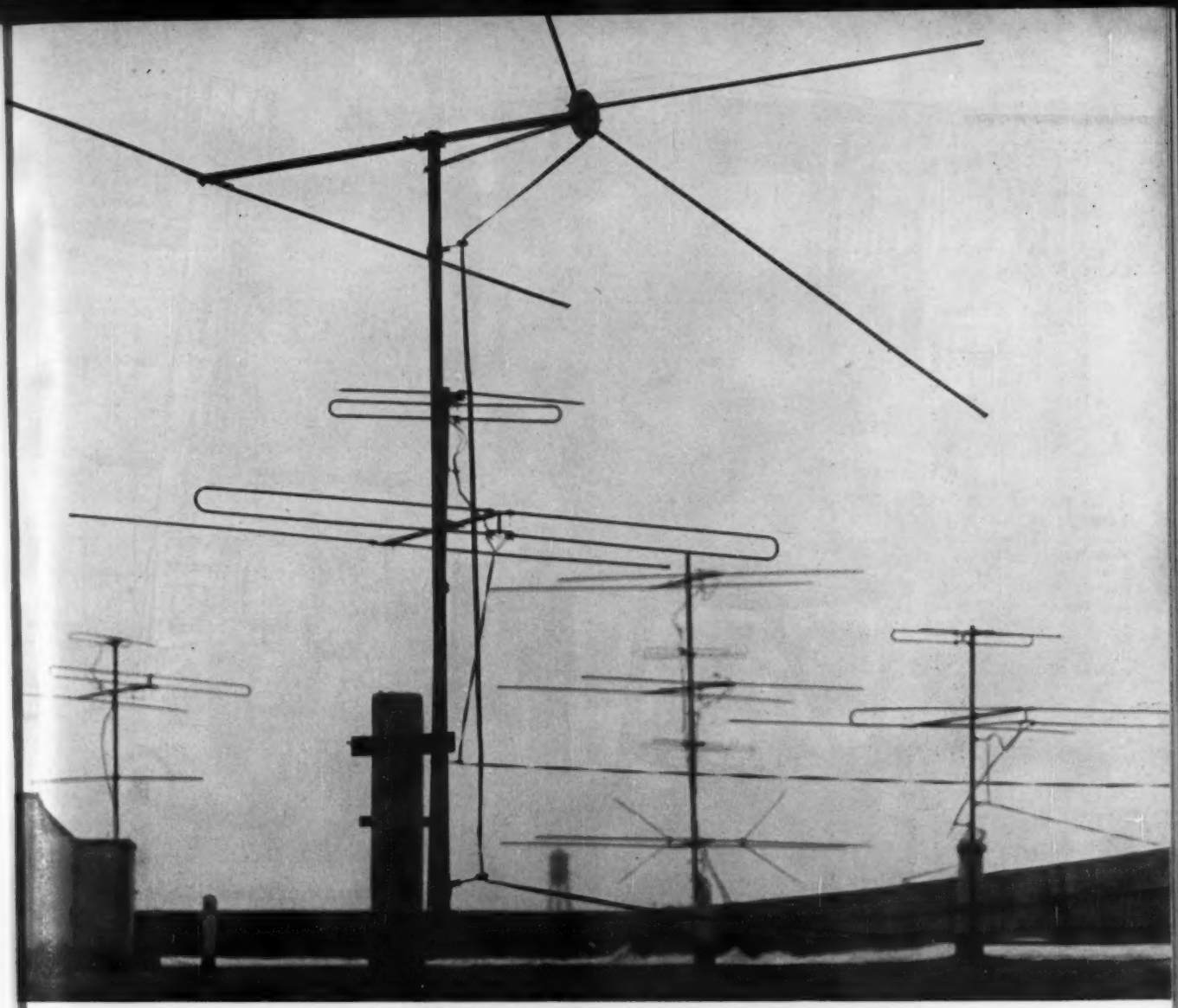
• KE projects include work in Argentina, Australia, Brazil, Formosa, Japan, New Zealand, as well as Canada and the United States. Assignments range from preliminary planning to plant construction.

5469-5



WHICH ONES WILL LAST (and last, and last!)?
THOSE MADE OF WEIRKOTE® ZINC-COATED STEEL!

Steel tubing that's protected against corrosion even under the most trying circumstances. Steel tubing that's easily fabricated to meet the most exacting specifications.

That's what you get in tubing made of Weirkote zinc-coated steel!

Weirkote's zinc coating—applied by the continuous process throughout, and so uniformly that every square inch is protected—is skin-tight. There's absolutely no flaking or peeling no matter how tortuous the crimping, twisting or other stresses of fabrication. In fact, Weirkote can be worked to the very limits of the steel itself.

The use of Weirkote can eliminate the need for any further coating process after fabrication. Its tight zinc coating is completely intact and remains so during fabrication and on the job. Weirkote zinc-coated steel tubing is particularly suited for jobs where weather is a factor to be taken into consideration.

Take a good long look at the possibilities and advantages of using Weirkote zinc-coated steel to meet your tubing requirements. For the complete story on Weirkote and how it can help you, write Weirton Steel Company, Dept. A-7, Weirton, West Virginia.

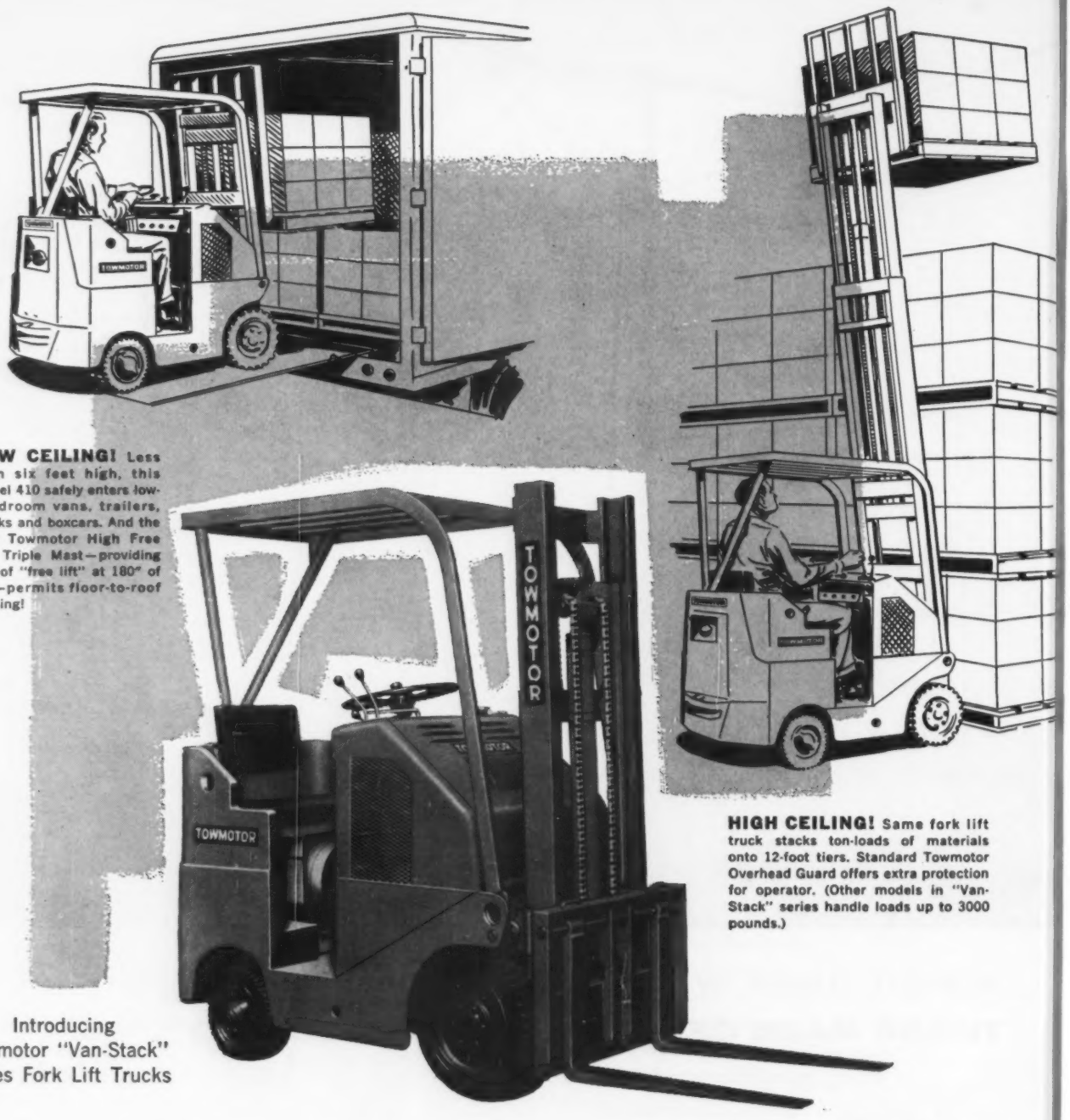
WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



LOW CEILING! Less than six feet high, this Model 410 safely enters low-headroom vans, trailers, trucks and boxcars. And the new Towmotor High Free Lift Triple Mast—providing 65" of "free lift" at 180" of lift—permits floor-to-roof loading!

HIGH CEILING! Same fork lift truck stacks ton-loads of materials onto 12-foot tiers. Standard Towmotor Overhead Guard offers extra protection for operator. (Other models in "Van-Stack" series handle loads up to 3000 pounds.)

Introducing
Towmotor "Van-Stack"
Series Fork Lift Trucks

New Towmotor does double duty!

You'll profit in many extra ways by owning a new Towmotor "Van-Stack" Series Fork Lift Truck.

"Almost unbelievable—but I saw it!" said an amazed MHI Show-goer who witnessed this double-duty lift truck in action in June. Thousands saw it drive in low-headroom trailer, load it to roof, then stack heavy units on 12-foot high tiers.

This truck (only 32" wide) zips through congested 3-foot aisles—maneuvers sharp corners—hustles big loads indoors and out—and enters elevators for fast floor-to-floor service.

On top of all this, its increased hoisting speed, dual-entry convenience, powerful 4-cylinder "economy" gas or LP-gas engine, weatherproof instrument panel—and other exclusive Towmotor features—make it the foremost fork lift truck in 2000-3000 pound class! Ask for *"Van-Stack" Series Folder SP-25.* Write Towmotor Corporation, Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN GANG®
-**GERLINGER** LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

depend on
WEATHERHEAD
for SERVICE and SATISFACTION on all industrial hose applications

Any Size
Any Length
Any Pressure
Any Quantity
Any Hose End Combinations
From the hose types and styles shown below

BULK HOSE

FINISHED ASSEMBLIES

STANDARD HOSES

LOW PRESSURE
H-9 — SAE 30R2
H-100 — COTTON COVERED

MEDIUM PRESSURE
H-17 — SAE 100R3

HIGH PRESSURE
H-25 — SAE 100R2

MEDIUM HIGH PRESSURE
H-69 — SAE 100R5

MEDIUM HIGH PRESSURE
H-108 — SAE 100R1

HIGH PRESSURE
H-35, H-50 — Spiral Wire Reinforced

REUSABLE ENDS

STEEL
STANDARD 2-PC. END
For fast assembly and positive, leakproof connections. Designed for dependable performance under high pressure. Skive and no-skive.

CLAMP-TYPE
For most two-wire braid high-pressure hydraulic hose applications. No skiving of hose or special tools required.

BARB-TITE ENDS
Fast, easy push-on, stay-on hose ends for all types of low pressure applications. Sizes ¼" to ¾" I.D. Rugged and durable.

HOSE ASSEMBLIES

PERMANENTLY ATTACHED HOSE ENDS
Swaged or crimped permanently attached hose ends. Any quantity, any size, any type. ⅛" to 2". For all working pressures.

CRIMPED

SWAGED

TUBE-HOSE ASSEMBLIES

THE WEATHERHEAD COMPANY
FORT WAYNE DIVISION • Dept. IA-8, 128 West Washington Blvd.
Fort Wayne, Indiana

THE 49TH STATE IS BORN...

Commemorated in Enduring Bronze

Alaska, born January 3, 1959, is the first state to be admitted to the United States since Arizona became the 48th state on February 14, 1912.

Commemorating this rare and unusual occasion is the Alaska Statehood Official bronze medal authorized by the first session of the First Legislature of the State of Alaska and reproduced from models by Medallic Art Company of New York City.

Issued July 4th, this memorable medal may be obtained from leading department stores and coin dealers.

Special bronze alloys, carefully formulated to exacting specifications are continually prepared in our mills in Bristol for commemorating this and other historic events.

Eisenhower inaugural medals struck by Medallic Art Company . . . special bronze alloy supplied by Bristol Brass.

The **BRISTOL BRASS CORPORATION**

Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.

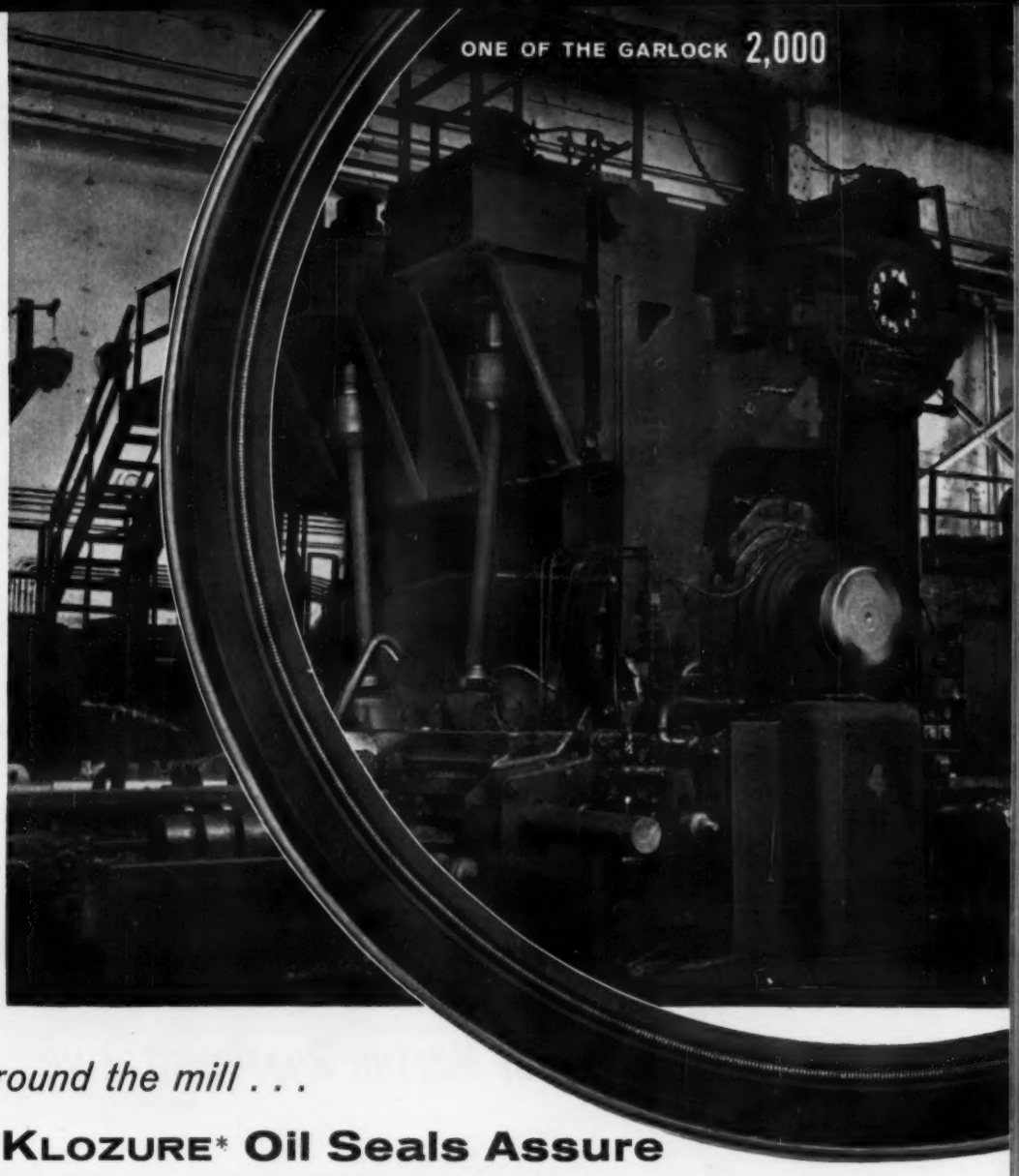
Model 64 assembled KLOZURE for back-up and work rolls. Designed for large shafts, severe service.

Model 82 bonded KLOZURE for back-up and work rolls, normal to high speeds. Comes as large as 44" diameter.

Model 21 or 23 Split- KLOZURE for installation without disassembly of equipment. Medium-speed service.

Model 142 face type KLOZURE for mill rolls. Designed to seal surfaces perpendicular in shaft.

Model 53 assembled KLOZURE for table rolls, normal to high speeds. Withstands temperatures to 250° F.



All around the mill . . .

Garlock KLOZURE* Oil Seals Assure Smooth, Dependable Operation

ON ALL PARTS OF A STEEL MILL, KLOZURE Oil Seals prevent leakage of vital bearing lubrication while protecting the bearings themselves from dirt, slag, scale, and spray. There's a KLOZURE design for *every* job, no matter how difficult.

MODEL 142, for example, keeps water splash and scale out of bearings at the shoulder of a mill roll. Model 53 is recommended for table rolls; Models 64 and 82 are applied for protecting bearings on back-up and work rolls. Where equipment can't be dismantled easily, Model 21 or 23 Split-KLOZURES are the choice.

ALL KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40°F to +250°F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500°F.

KLOZURE Oil Seals are another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. Call your local Garlock representative, or write for Catalog 30.

*Registered Trademark

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

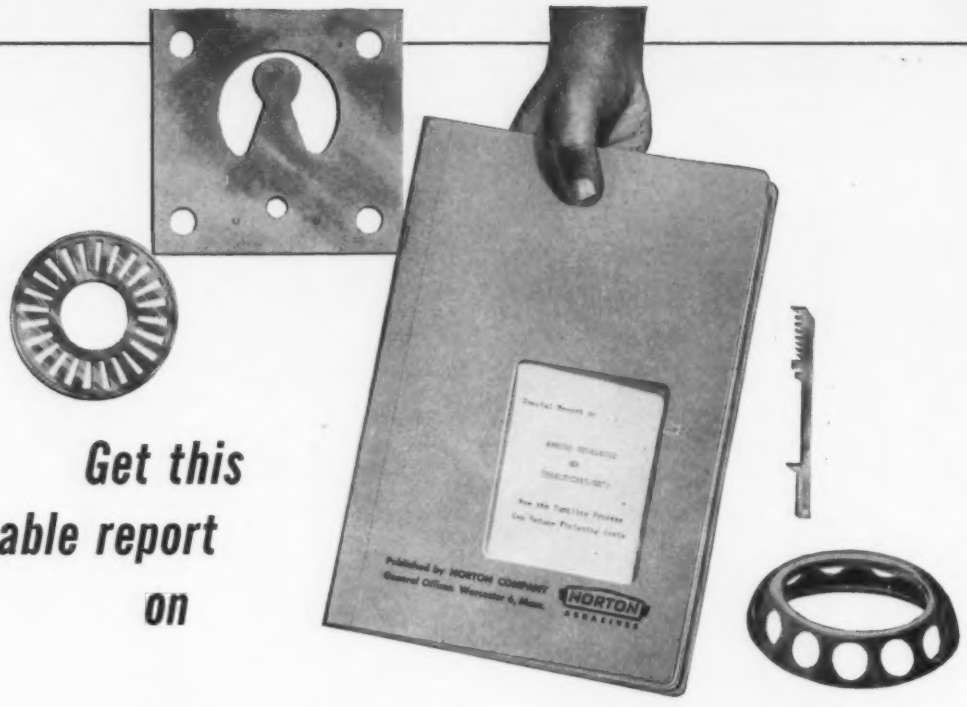
For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

Canadian Division: The Garlock Packing Co. of Canada Ltd.

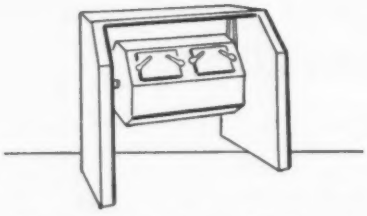
Plastics Division: United States Gasket Company



Get this valuable report on

The best ways to finish metal stampings

from your Norton Representative



Newest in the Norton series of reports to industry is *Barrel-Finishing of Metal Stampings*, prepared by Norton engineers.

Based on continual observation of finishing techniques in many plants, this report brings you plenty of worthwhile information on the advantages of barrel-finishing equipment and abrasives. Included are facts on improving fatigue resistance of metal stampings . . . types and sizes of stampings you can barrel-finish . . . and reports like the following:

Cylindrical, steel-cage stampings had many slots with burrs on edge of each slot. Requirements were: removal of burrs, forming slight radii on all edges, improving surface finish. A large finishing barrel was charged with random-shaped ALUNDUM* TUMBLEX* *"A" abrasive chips in a water solution level with the top of the mass. All operations were completed in one run and thousands of parts were barrel-finished in one day.*

Aircraft panel stampings, 12" square x 1/8" thick, perforated, were processed by placing 12 panels 1" apart, using steel rods with fiber bushings as spacers. This whole unit was placed in the barrel, where bonded, triangular-shaped ALUNDUM TUMBLEX *"T" chips successfully removed all burrs from the stampings' edges and perforations.*

Your Norton Representative can supply you with this report fast — will also provide literature on all TUMBLEX abrasive types: "A" (random-shaped chips), "T" (bonded triangles), "S" (bonded spheres), and "N" (natural stones), covering the widest range of finishing requirements. And samples of your work parts sent to our Sample Processing Department will be promptly barrel-finished and returned to you with complete facts as to abrasives, methods and equipment. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world. G-371

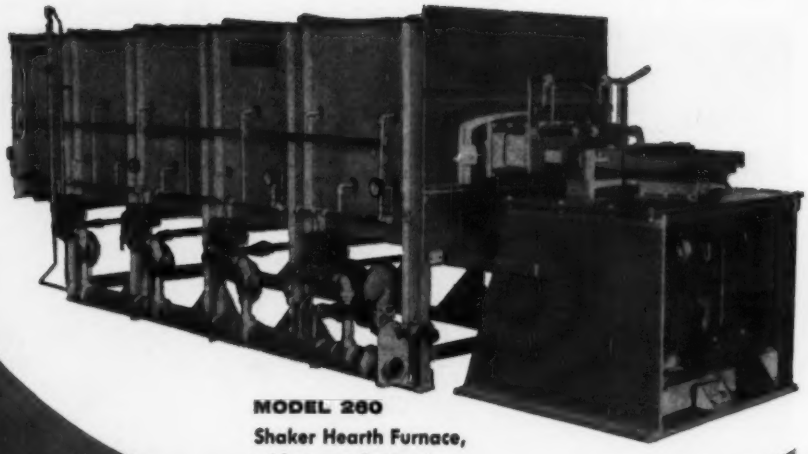
*Trade-Marks Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

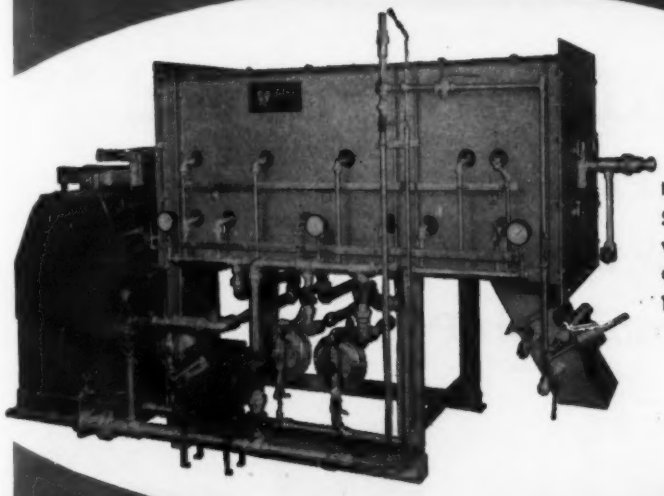
Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electro-Chemicals — **BEAR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

HEAT TREAT SMALL PARTS BEST with AGF'S SHAKER HEARTH FURNACES



MODEL 260
Shaker Hearth Furnace, with a production capacity of 800 lbs. per hour.



MODEL 238-A
Shaker Hearth Furnace, with a production capacity of approximately 150 lbs. per hour.

81 YEARS OF PIONEERING — AMERICAN GAS FURNACE CO. — ELIZABETH, N. J.

VERSATILE Complete atmosphere control for heat treating from pen points to forgings, *IN THE SAME FURNACE.*

SIMPLE Complicated maintenance problems are eliminated by the unique method of work conveyance . . . A reciprocating hearth plus a simple mechanical drive.

EFFICIENT No conveyor to drag heat from furnace . . . A CONTINUOUS FURNACE for automatic or manual feeding.

FULL MUFFLE CONSTRUCTION Provides exact control of processing atmosphere . . . Many small burners, in multiple control zones, heat the muffle uniformly.

Shaker Hearths are available with capacities from 25 lbs. per hour to 800 lbs. per hour.

Send for complete data and specification sheets on these and all of the other many "QUALITY BUILT" AGF furnaces for all specific and diversified uses.

AMERICAN GAS FURNACE CO.
1004 LAFAYETTE STREET — ELIZABETH 4, N. J.

119 Eyes, $615,468* Saved

in 5 Years at Pullman-Standard

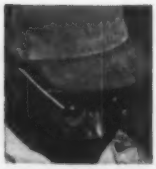
...another answer to

"Does Eye Protection Pay Off?"

At plants of leading car builder, Pullman-Standard Manufacturing Company, wearing of eye protection is a "must". It pays — in eyes saved, pain saved, skills saved and dollars saved. Eye protection equipment is furnished free to all employees, including those needing prescription glasses. (All visitors are furnished Safety Glasses or Plastic Cover Shields for wear over personal glasses.) RESULT: IN 5 YEARS OVER 67½ MILLION MAN-HOURS WORKED WITHOUT A LOST EYE.

Quality eye protection equipment such as manufactured by American Optical Company featuring ***safety standard*** frames and lenses is a vital ingredient in achieving performance like this. And it can pay for itself in less than 6 months' time. Call your nearest AO Safety Representative or write us at Southbridge, Mass.

*Based on average award of $5,172 for each lost eye for Workmen's Compensation alone in the several states in which Pullman-Standard operates plants.



JOHN MIMS

Splatter of hot solder cracked his left bifocal ***heat treated*** safety lens. Result: Lens took punishment, eye saved.

ERNEST DEMES

Hot tar splattered lens; burned cheek, eyebrow, forehead. Result: Eye saved.

BRUCE REED

Piece of broken drill struck left lens of safety goggles, continued up to roof of building "singing like a bullet". Result: Eye saved.

Always insist on the AO Trademark on lenses and frames

American Optical
COMPANY
SAFETY PRODUCTS DIVISION
SOUTHBRIDGE, MASSACHUSETTS

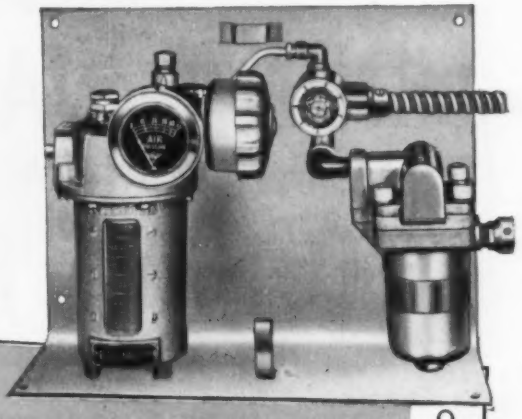
Safety Service Centers in Principal Cities

How to choose a

LUBRICATION SYSTEM

that provides constant, uniform lubrication

at savings of up to **90%**



use this handy check list:

Will your lubrication system be fully automatic? Oil-Mist starts and stops at the touch of your machine switch.

Will the system that you choose cut oil consumption by 90%? With the Alemite Oil-Mist System you can get better bearing lubrication with only 1/10th as much oil as required by other methods.

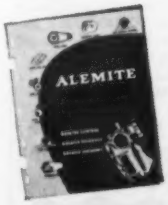
Will your lubrication system reduce bearing temperatures? The answer is "yes," if it's an Alemite Oil-Mist System. Reduction in fluid oil friction—plus air flow through bearing—greatly cuts bearing heat.

Will your system extend bearing life? You can definitely count on it, if you choose Oil-Mist. Oil-Mist has extended the service life of many bearings, even under adverse operating conditions, from 10 to 12 times!

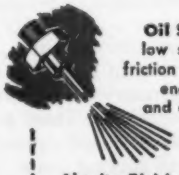
Will you have a continuous system? Oil-Mist constantly feeds a uniform volume of fresh oil to each bearing. No oiling schedules. No feast-or-famine lubrication.

Does it protect against contamination? Satisfied Oil-Mist users say yes. A constant flow of clean, air-oil mixture—Oil-Mist—through bearings keeps out dirt and abrasives. Oil-Mist also eliminates wasteful oil handling and applying.

Lubricates any bearing on any machine in One Of Three Ways:



Oil-Mist for high speed anti-friction type of bearings.



Oil Spray for low speed anti-friction and open and enclosed gears and chains.

Condensed Oil for plain bearings, slides, ways, vees, cams, and rollers.

MAIL COUPON for Oil-Mist demonstration and information

Symbol of SW Excellence

ALEMITE DIVISION **STEWART-WARNER** CORPORATION

Alemite Division, of Stewart-Warner, Dept. DD-49

Alemite Division, of Stewart-Warner, Dept. BB-49

Alemite, Division of Stewart-Warner, Dept. G89
1850 Diversey Parkway, Chicago 14, Illinois

☐ Please send me a free copy of your Oil-Mist catalog.

☐ Please have your Alemite Lubrication Representative arrange a no-obligation demonstration.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

DON'T WASTE DOLLARS

IN MACHINE OUTPUT

TO SAVE PENNIES

IN TOOL LIFE

HERE'S HOW SOME SHOPS HAVE DOUBLED AND TRIPLED THE OUTPUT OF EXPENSIVE MACHINES

Typical Examples—Same Machines . . . Same Tools . . . Same Workpieces								
	Job No. 1		Job No. 2		Job No. 3		Job No. 4	
	240-Minute Tool Life Setup	25-Minute Tool Life Setup	75-Minute Tool Life Setup	25-Minute Tool Life Setup	120-Minute Tool Life Setup	80-Minute Tool Life Setup	120-Minute Tool Life Setup	22-Minute Tool Life Setup
Machine Cost per Hour	$ 8.00	$ 8.00	$10.00	$10.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00
Tool Cost per Hour	$ .04	$ .40	$ .36	$ .76	$ .14	$ .215	$ .14	$ .77
Cost per 8-Hour Shift	$64.32	$67.20	$82.88	$86.08	$73.12	$73.72	$73.12	$78.16
Pieces per Shift	51	181	8	17	94 hrs./pc.	41 hrs./pc.	8	16
Cost per Piece	**$ 1.26**	**$ .37**	**$10.36**	**$ 5.06**	**$859.16**	**$377.81**	**$ 9.14**	**$ 4.88**
Cost Reduction	70%		51%		56%		47%	

Get the complete story . . . send for the booklet "There's Profit in Retiring a Tradition."

From many machine shops the story is the same—*they are sacrificing low-cost carbide inserts through increased feeds and speeds . . . to achieve startling savings in total-cost-per-piece.* Production increases even greater than 100% have been recorded. The increased tool costs were insignificant by comparison.

Where machines have been operating at less than maximum efficiency, *unit cost can be reduced on many jobs overnight* . . . merely by using modern cutting tools to get full potential machine output . . . instead of operating at fractional machine capacity to gain long tool life.

This idea has been *PROVEN-IN-USE* by many progressive plants. We will gladly send you records of such operations. These results can be duplicated in plants where machines and talented operators have been held back by old ideas about tooling and tooling costs. Ask your Kennametal Carbide Engineer how Kendex* (patented) tooling can help you get more efficient output from your machines . . . or write KENNAMETAL INC., Latrobe, Pennsylvania, for the booklet "There's Profit in Retiring a Tradition."

*Trademark

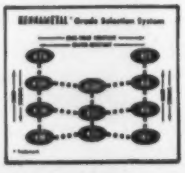
9-7229

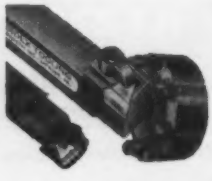
INDUSTRY AND
KENNAMETAL
. . . Partners in Progress

TO MULTIPLY YOUR MACHINE OUTPUT ...YOU NEED 3 THINGS:

The 'Three-Man Tooling Team' that utilizes the specialized knowledge of your Tool Engineer, your Machine Operator, and the Kennametal Carbide Engineer . . . *to get the right tooling on every job.*

The Kennametal complete range of grades that provides the precise properties and uniformity that permits *accurate prediction of tool life.*

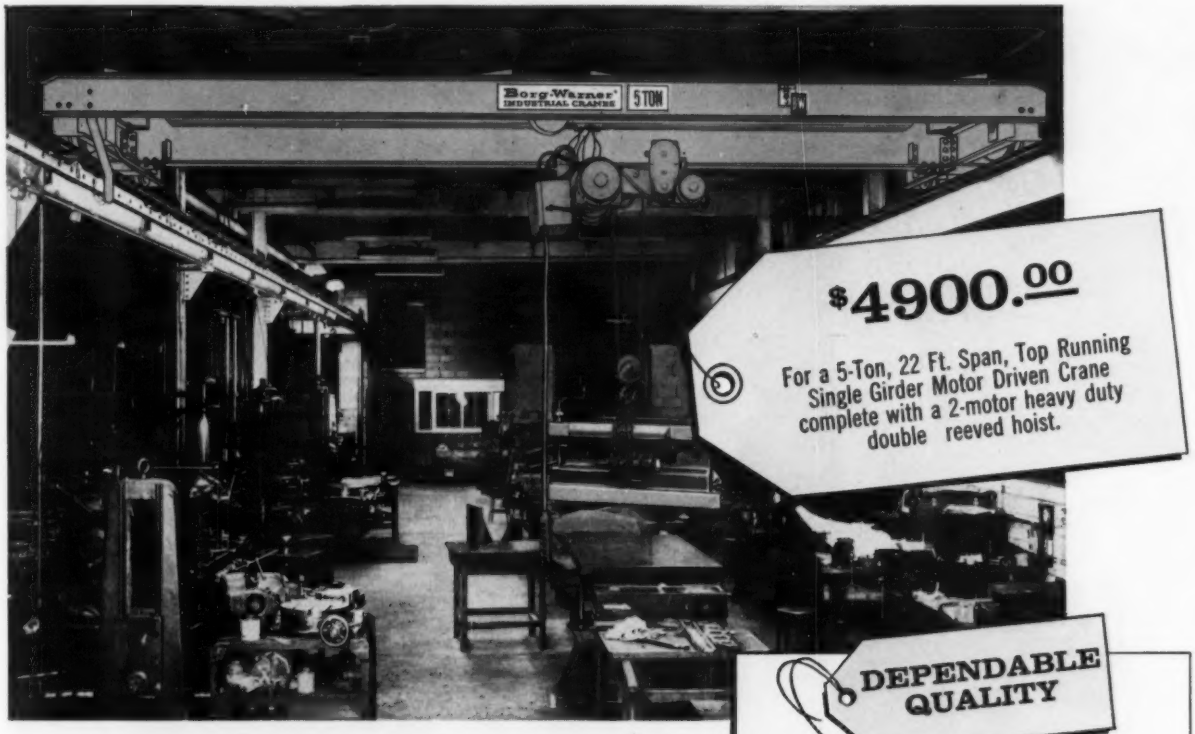




Kendex instant insert change without need to reposition the tool. This is the key to this new practice . . . *frequent tool change without excessive down-time.*

PRODUCTION WISE and COST CONSCIOUS!

Borg-Warner quality assures you of top value in every capacity, performance and price range



$4900.00

For a 5-Ton, 22 Ft. Span, Top Running Single Girder Motor Driven Crane complete with a 2-motor heavy duty double reeved hoist.

PRODUCTION WISE

There's no room in this busy shop area for aisle-filling floor-type handling equipment. But, an economical Borg-Warner 5-Ton Crane System transports materials and work swiftly, smoothly and quietly with minimum interference to production.

COST CONSCIOUS

Borg-Warner engineers and production men have made extensive use of interchangeable, standardized components resulting in real savings for you. You get more crane, more performance and greater dependability, for a smaller investment.

If you are planning on expansion or modernization, it will pay you to find out how Borg-Warner Industrial Cranes can supply you with the best values in overhead materials handling equipment.

DEPENDABLE QUALITY

- Full 5-ton rating with ample reserve capacity.
- Heavy duty Borg-Warner Motor Reducer Bridge Drive with integral fluid coupling.
- Heavy duty double reeved close headroom hoist.
- Heavy duty forged steel wheels.
- All welded, jig assembled, jig bored end trucks.
- Long life precision ball and roller bearings.
- Precision assembly of girder and end trucks with fitted bolts in reamed holes.
- Outrigger machinery girder construction.
- Full magnetic push button control.

ADVANCED DESIGN

The N-TRMD illustrated is a typical Borg-Warner Industrial Cranes Top Running Single Girder Motor Driven Crane. The precise equipment to meet your specific needs is available. Consult with Borg-Warner Industrial Cranes engineers.

Industrial CRANES — B-W — BORG-WARNER

Design it better ... Make it better.

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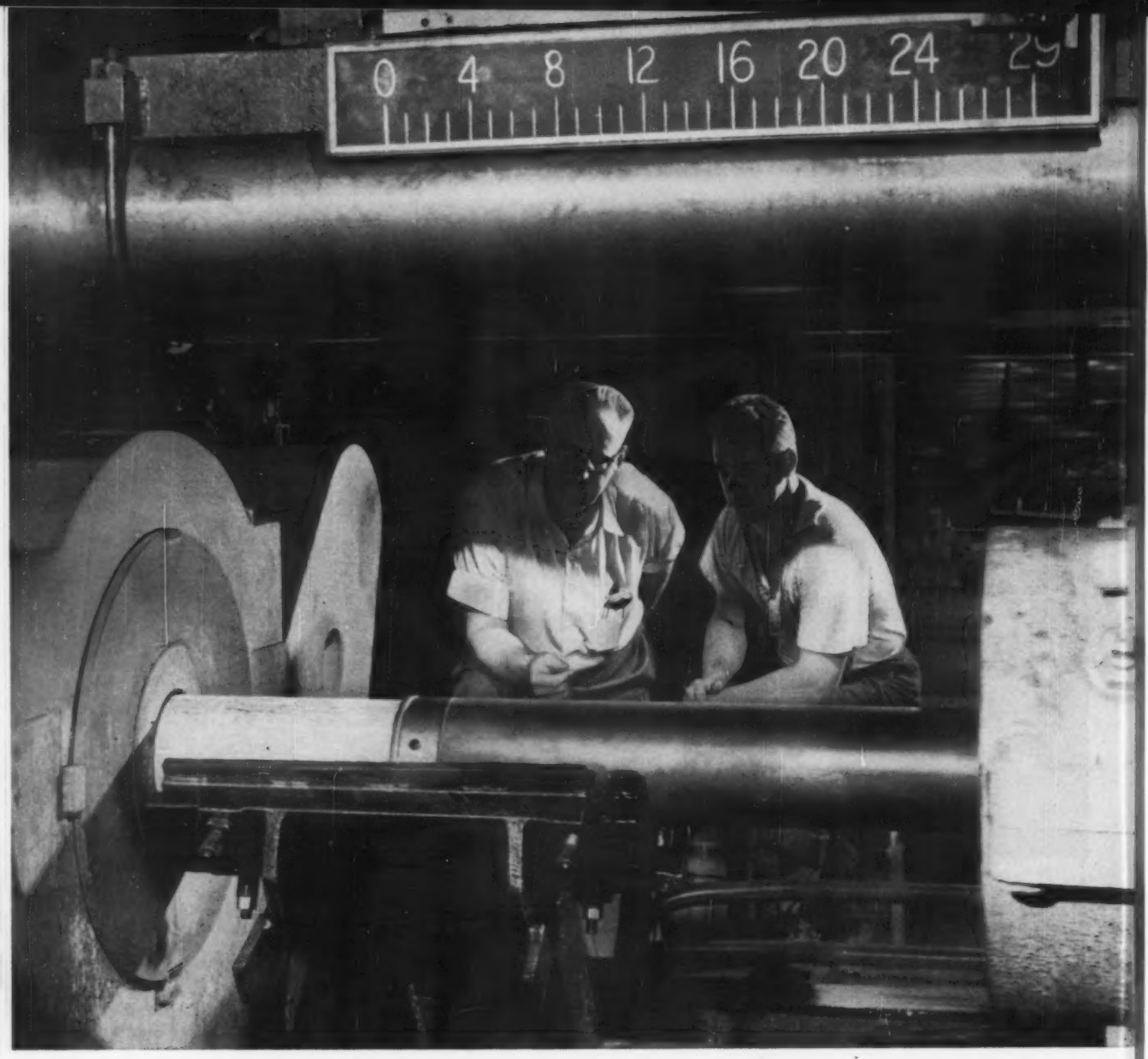
Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois



Why ALCAN extrusion ingot "runs" easier... faster... more economically!

How much difference would better quality billet make in your extruding costs and productivity? *A substantial difference* . . . if the billet you switch to is ALCAN!

For you will find that ALCAN billet offers you every fabricating advantage. It pushes easier, faster. It gives you longer die-life . . . less scrap . . . and better quality of finished product. All good reasons why a trial run can prove to you that this is the most economical billet you can use!

From mining to casting—countless checks on quality make ALCAN the finest of all billet products. It is made entirely of clean, primary metal . . . unexcelled in internal structure and surface smoothness . . . and cast to the industry's closest tolerances.

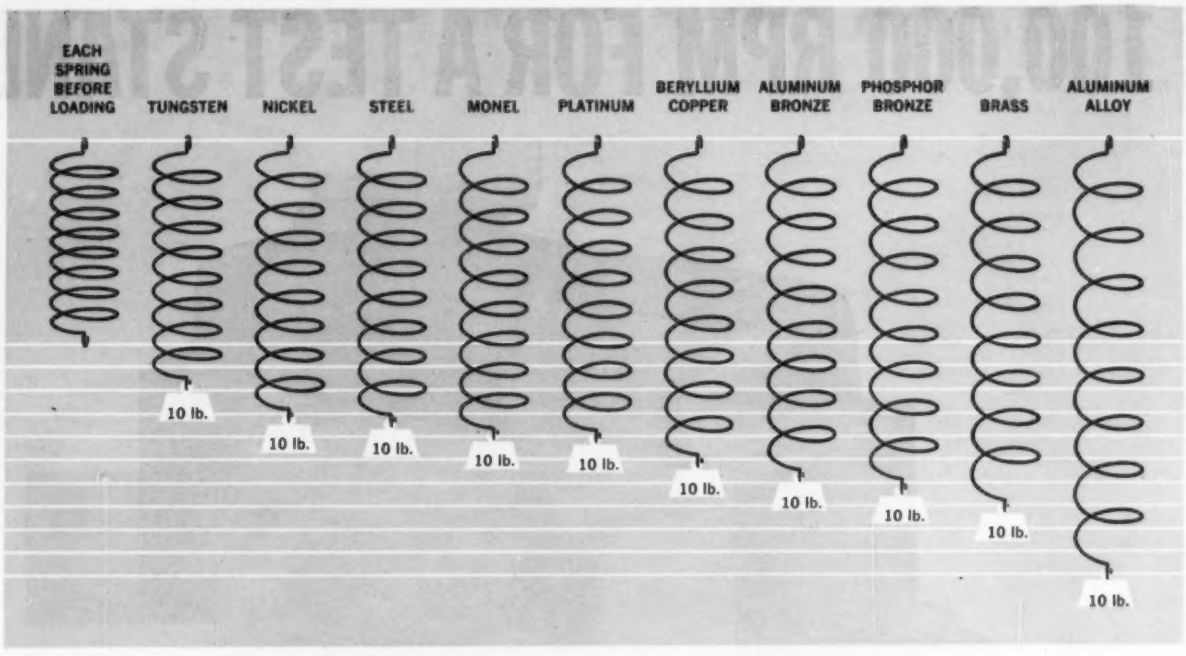
Telephone us today about testing ALCAN billet on your own equipment! We welcome the opportunity to show you the difference it can make in your extruding costs and productivity.

Aluminium
Limited

Ingot Specialist...serving
American Aluminum Fabricators—

In the U. S.—Aluminium Limited Sales, Inc., 630 Fifth Avenue, N.Y. 20, N.Y.
CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANTA • ST. LOUIS

Additional distribution (Alcan Foundry Alloys):
Apex Smelting Company, Chicago, Cleveland, Los Angeles
Charles Batchelder Co., Inc., Botsford, Conn.



How much deflection do you want in a spring?

The wide range of stiffness characteristics available in different materials offer unusual opportunity to solve spring deflection problems. How wide is shown in the chart above. The tension springs are all of identical dimensions but of different materials and indicate the relative deflection obtained from applying the same load (assuming the stresses are within safe limits). This basic principle is often overlooked in the approach to spring selection not only of extension springs but other types: flat, torsion, etc. Because our daily work includes such a wide range of spring usage, we are in a position to help you in the early stages of spring consideration, both in material selection and production short cuts. A handy pamphlet to have at your elbow is our "Metal Selector." Write for your copy.

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
B-G-R Division, Plymouth and Ann Arbor, Mich.
Gibson Division, Chicago 14, Ill.
Milwaukee Division, Milwaukee, Wis.
Raymond Manufacturing Division, Corry, Penna.
Ohio Division, Dayton, Ohio
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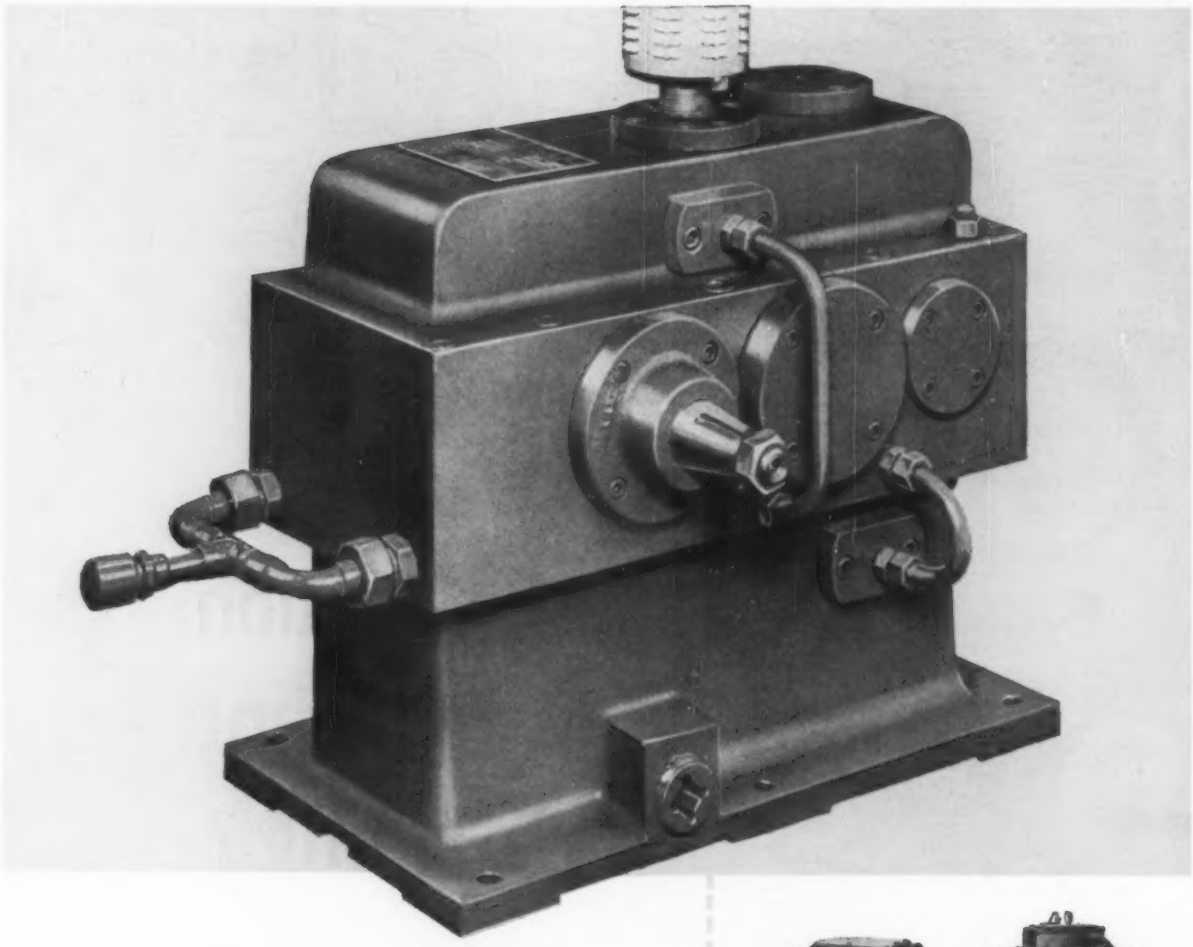
San Francisco Sales Office, Saratoga, Calif.
Seaboard Pacific Division, Gardena, Calif.
Cleveland Sales Office, Cleveland, Ohio
Dunbar Brothers Division, Bristol, Conn.
Wallace Barnes Steel Division, Bristol, Conn.
Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

sops

100,000 RPM FOR A TEST STAND



Another example of Farrel's ability to meet extraordinary gearing requirements

The speed increaser shown above—built for operation at 100,000 rpm—is only one of the scores of highly specialized test-stand units designed and built by Farrel. Three other examples are shown at the right. Each was individually engineered to customer requirements.

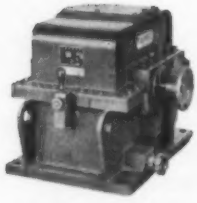
This experience offers virtual assurance of the ability to solve your high-speed gearing problems. The next time you need a test-stand unit, call Farrel. In the meantime send for a copy of bulletin 451.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Boston, Akron, Ann Arbor (Mich.), Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Fayetteville (N. C.)
European Office: Piazza della Republica 32, Milano, Italy

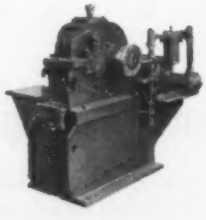
FARREL

FB-1164



Special 375 HP speed-increasing unit, with two speed ranges, 6,000/10,769 RPM and 6,000/15,100 RPM.

Special DD-9 speed-increasing unit, 660 HP, input speed range from 1,500 to 3,000 RPM, output speed range from 20,000 to 40,000 RPM.



Special SI-825 speed-increasing unit, 150 HP, 3,000 to 5,000 input RPM, with 3 gear-set ratios—1:7.971, 1:2.5091, 1:1.0127.

OPTIMUM ELECTRODE PERFORMANCE

. . keeps electric furnace steel costs down.

The flawless machining of GLC electrode sockets and Unitrode® nipples, to the most exacting tolerances, raises electrode column efficiency to new highs through the sharp reduction in joint resistance. Let comparisons prove this to you!

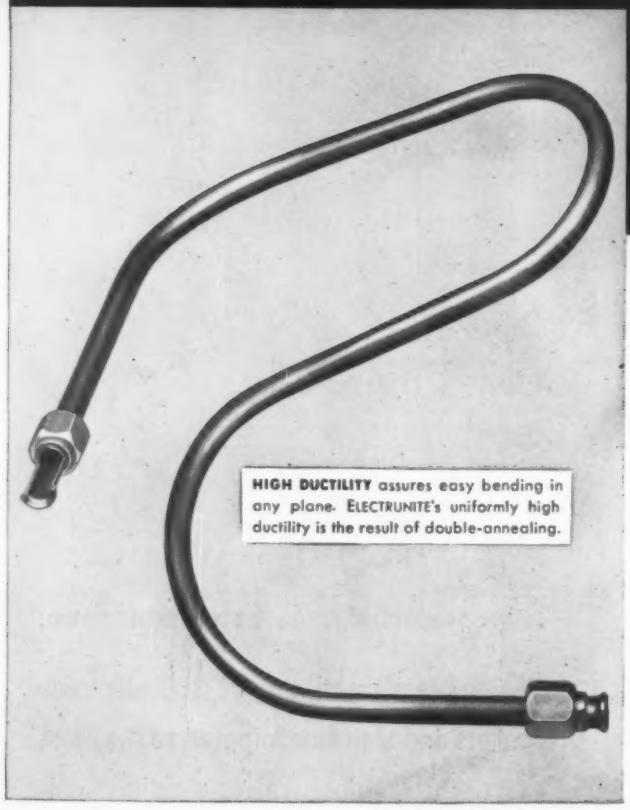
PRODUCTS ELECTRODE GLC DIVISION YOU CAN TRUST

GREAT LAKES CARBON CORPORATION

18 EAST 48TH STREET, NEW YORK 17, N. Y. OFFICES IN PRINCIPAL CITIES

Join the Big Switch to Republic ELECTRUNITE

HYDRAULIC FLUID LINE TUBING



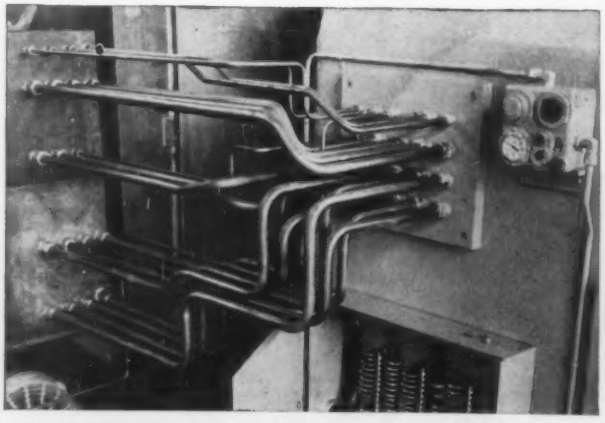
HIGH DUCTILITY assures easy bending in any plane. ELECTRUNITE's uniformly high ductility is the result of double-annealing.

Get more tube per dollar . . . Now Electric Resistance Weld Steel Tubing included in JIC Standards . . .

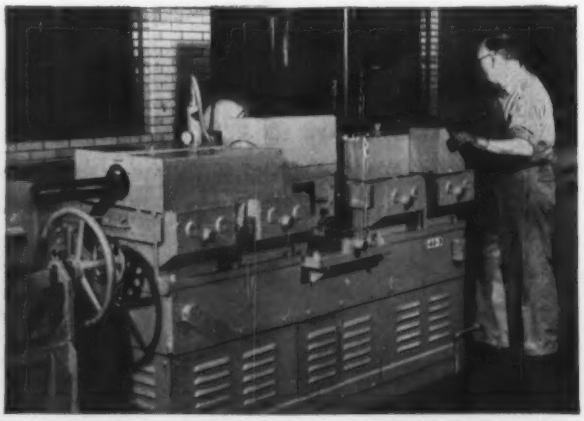
Join the hundreds of manufacturers using millions of feet of Republic ELECTRUNITE® Hydraulic Fluid Line Tubing. As a result of their own tests, many equipment and machinery builders and their maintenance departments switched to this quality-proved hydraulic tubing prior to its being included in the JIC Standard.

Like them, you'll get *more tube per dollar* when you specify Republic ELECTRUNITE Hydraulic Fluid Line Tubing. But initial cost savings are only part of the story. *Savings in downtime* reflect even greater cost reductions!

ELECTRUNITE—produced by the world's largest manufacturer of electrically welded hydraulic tubing—is made from flat-rolled steel. *Prime* steel—checked for defects as only flat-rolled steel can be checked. Then: formed, welded, annealed,



READILY ASSEMBLED—close dimensional tolerances maintained in the drawing of ELECTRUNITE Hydraulic Fluid Line Tubing assure lower-cost installation.



QUALITY YOU CAN MEASURE! Specify FARROWTEST® non-destructive electronic testing to MIL-T-17188 or ASTM-A-178 for extremely critical applications. Offered as an alternate to hydrostatic testing.

ELECTRUNITE IS EASILY FLARED to accommodate standard flare-type fittings.

cold-worked, and annealed again into a tube of *prime* quality . . . a tube that meets or exceeds the normal life of tubing produced by any other method.

ELECTRUNITE'S uniform walls and concentricity, coupled with uniformly high ductility, assure better bending and flaring characteristics. In the *history* of ELECTRUNITE Hydraulic Fluid Line Tubing, no failure resulting from longitudinal or transverse cracks has been reported.

You'll find that ELECTRUNITE Fluid Line Tubing is available in all the sizes shown in the *JIC Standards Book.* Also available in an even wider range of sizes produced to our specification HL-1 (which meets all test requirements of the JIC Standard).

Investigate ELECTRUNITE'S many cost-reducing features. Contact your ELECTRUNITE sales representative or mail the coupon for complete information, including a copy of specifications.

AVAILABLE IN ALL SIZES SHOWN IN JIC STANDARDS BOOK. AVAILABLE IN A WIDER RANGE OF SIZES PRODUCED TO OUR SPECIFICATION HL-1 (WHICH MEETS ALL TEST REQUIREMENTS OF THE JIC STANDARD).

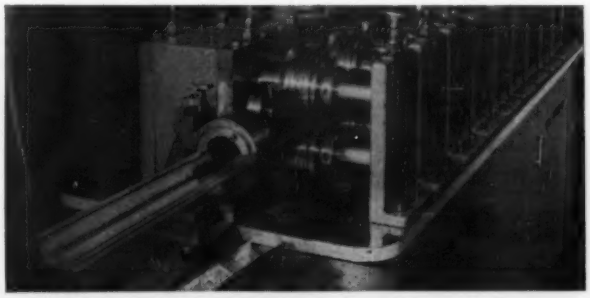
REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

ENGINEERED FOR LONG LIFE. Republic Skid Boxes have corrugated construction, smooth double roll around top that eliminates sharp edges. Four-way fork entry, which simplifies handling, is available. Heavy-duty stacking brackets permit tiering to any practical height. For the latest materials handling ideas, consult Republic Materials Handling specialists. Send coupon.

REPUBLIC'S NEW HIGH STRENGTH POWDER, TYPE HS6460,

is ideal for sinterings of highly stressed components. Provides minimum tensile strength of 60,000 psi at 6.4 density as sintered . . . 100,000 psi after heat treatment. Less than .004% shrinkage from die size at 6.4 density. Can be used with existing operating equipment. Available in quantities up to and including 12 tons or multiples. Send for technical data sheet.



SAVE PAINT PREPARATION COSTS on your formed steel products by specifying Republic Electro Paintlok®. Special paint-holding surface applied at our mills won't crack, flake, or peel—even under severe bending—as demonstrated by this acoustical panel forming operation. Final finish can be applied immediately, with excellent results. Mail coupon for complete information.

REPUBLIC STEEL CORPORATION
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1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on:
- ☐ ELECTRUNITE Hydraulic Fluid Line Tubing, including a copy of specifications
- ☐ Republic Materials Handling Equipment
- ☐ Republic Electro Paintlok ☐ Type HS6460 Metal Powder

Name_____ Title_____

Company_____

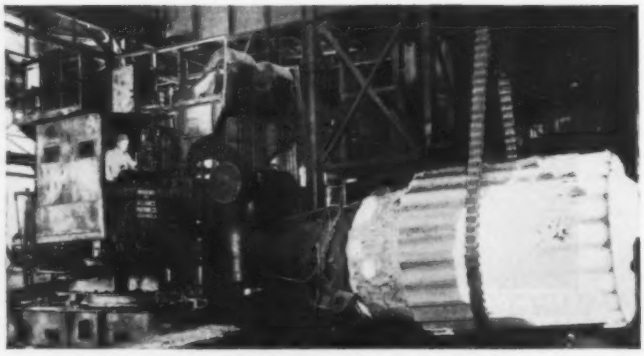
Address_____

City_____ Zone____ State_____

PROOF... *That* MESSINGER BEARINGS *Are Built to Last*

Through nearly half a century, Messinger Roller Bearings have built an enviable reputation for long, trouble-free service under continuous operation carrying heaviest loads. The two installations mentioned here are typical of many in which Bearings by Messinger are "still going strong" after ten . . . twenty . . . thirty years or longer. To incorporate Messinger Bearings in the design of your product is to enhance it with assurance of faultless performance for the longest possible measure of time.

After 39 Years... the Messinger Roller Bearing carrying a thrust load of 6,000,000 lbs. in this 350-Ton Crane at the Philadelphia Naval Shipyard, is still demonstrating the soundness of Messinger engineering and the enduring quality and efficiency of Messinger Bearings.



After 15 Years... the large Messinger "X" Roller Bearing in this heavy-duty Forging Manipulator was still operating with its original smooth, trouble-free efficiency.

Make Your Product Serve Better, Longer . . . With Messinger Bearings

Smoothing Industry's Pathway ...*for Nearly Half a Century*

MESSINGER BEARINGS, INC.

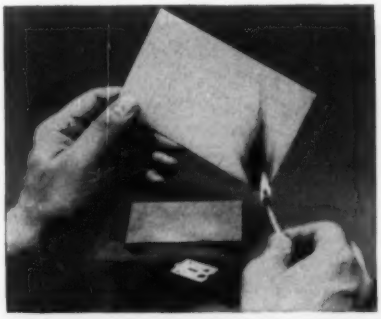
D STREET ABOVE ERIE AVENUE, PHILADELPHIA 24, PENNA.

BALL AND ROLLER BEARINGS • FEATHERWEIGHT TO HEAVYWEIGHT

PROGRESS IN PLASTICS

NEW FLAME-RETARDANT EPOXY LAMINATES OFFER HIGH STRENGTH-WEIGHT RATIO, LOW LOSS

Much is being said lately about the fabulous epoxies. No better use, however, has been made of these remarkable resins than the development by CDF of new improved laminates for electrical-insulating purposes.



New CDF epoxy Dilecto laminate exhibits flame-retardancy in simple match test.

CDF epoxy Dilecto® laminates, made with either treated glass-cloth or cellulose-paper base, combine the highest strength-to-weight ratio and the highest impact strength with low water-absorption, low loss properties, and improved machinability. The new epoxy Di-Clad® laminates for printed-circuit use also display exceptional foil-bonding strength, high hot-solder-resistance, and higher maximum operating temperatures than previously obtainable in standard laminates.

And now permanent flame-retardancy and excellent arc-resistance are added to many grades of epoxy laminates from CDF, both GB and XXXP. These laminates, known as the EFR series, meet NEMA G-11 and MIL-P-18177B, Type GEB. This combination of properties should further widen the range of applications for this superior insulating material. CDF Technical Bulletin 11200 describes epoxy Dilecto and Di-Clad laminates in detail.

REUSABLE INSTRUMENT-SHIPPING CASES

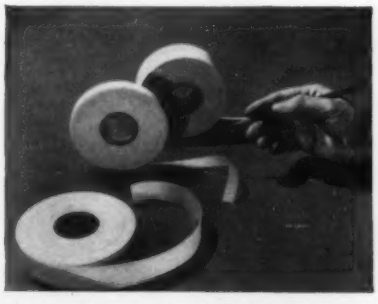
Replacing heavy, costly wooden cases for the transport of delicate aircraft and electronic instruments, CDF now offers fiberglass-reinforced polyester cases containing integral rubber-coated kapok cushioning, built for repeated usage with a wide range of instrument sizes and shapes. The complete line of new CDF instrument-shipping cases ranges in size from 12" x 14" x 7" to 25½" x 11" x 12½".

Measuring instruments packed for shipping in CDF laminated-plastics cases.

Savings through use of these cases are realized in original cost (10% lower than for wooden cases) and in their long useful life without wear or breakage. Request Bulletin MHC-591.

SKIVED TAPES OF UNSUPPORTED TEFLON

Four new grades of tape, made of skived duPont "Teflon" TFE fluorocarbon resin, are now available from



CDF. Excellent electrical properties, resistance of all common chemicals, and a low coefficient of friction characterize these new tapes, designed primarily for high-temperature and high-frequency wire and cable insulation. However, they may be used also as stock from which gaskets, seals, and miscellaneous small parts can be cut.

CDF tapes of Teflon range in width from ¼" to 12" in ⅛" increments, in thickness from .002" to .100". Request Technical Bulletin 97.

NEW CDF LITERATURE • *Bulletins referred to in this advertisement may be obtained from your CDF representative; or send the coupon below, indicating the Bulletins you wish sent to you.*

Continental-Diamond Fibre Corporation
Newark 85, Delaware

Please send me the following Technical Bulletin(s):

- ☐ Bulletin 11200 – CDF epoxy Dilecto and Di-Clad laminates
- ☐ Bulletin MHC-591 – CDF reusable instrument shipping cases
- ☐ Bulletin 97 – CDF skived Teflon tapes

Name_____ **Title**_____

Company_____

Street Address_____

City_____ **Zone**____ **State**_____

CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE Budd COMPANY • NEWARK 85, DEL.

In Canada: 46 Hollinger Road, Toronto 16, Ontario

Allen Hughes cut abrasive costs 18 to 1 at

Grinding the gripper-die marks off a jet turbine blade can be an expensive business. At the Harrisburg Works of Thompson Ramo Wooldridge, these super-alloy steel blades used to be semi-finished with coated abrasive belts until Industrial and Abrasive Control Engineer Paul Mazich started checking up on costs.

Mazich called in Bay State Abrasive Engineer Allen B. Hughes and he dug into the problem. Working with Bay State distributor General Machinery & Equipment Company, Hughes made a series of careful tests. The result was a grinding wheel that cut the annual cost of abrasive materials alone from $18,000 to $1,000. Its unique combination of special bond and abrasive grit increased cutting spread, prevented loading and eliminated the need for dressing so successfully that productivity rose, labor costs dropped and there were additional savings of around $5,000.

Like Allen Hughes, the Bay State Abrasive Engineer in your area is a trained expert. He backs up the work of the experienced men who represent Bay State's topflight distributors and Bay State's research labs back them both with new ideas, techniques and materials. *Better grinding at lower cost . . . that is our business.*

Industrial Engineer Paul Mazich examines finish on jet engine blade forging after off-hand grinding operation illustrated at right.

Operator E. S. Jones semi-finishes jet turbine blade in off-hand grinding operation with cool-cutting, self-dressing Bay State grinding wheel.

Thompson Ramo Wooldridge

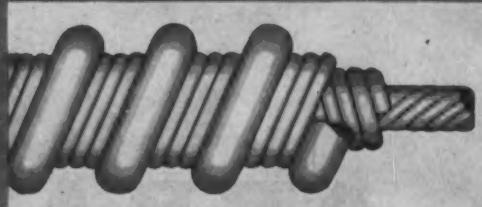
Allen B. Hughes worked up through Bay State's Westboro plant and then added extensive field experience so that his knowledge of abrasive problems and practical solutions for them covers every phase of abrasive engineering.

BAY STATE ABRASIVES

BAY STATE ® WHEELS of PROGRESS

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh, Los Angeles. *Distributors:* All principal cities.

How NS solved another special wire problem



REMOTE CONTROL cable for jet aircraft is made of layers of high-tensile National-Standard wire wound around a stranded core. Heavy outer wire provides helix or worm-gear surface for meshing with hobbed wheels.

Photo courtesy Pan American Airlines

Special National-Standard wire helps fly new jet-liners

When the age of commercial jet transportation in the U.S. began last January, giant jet-liners inaugurated flights across the country at speeds over 600 mph. To control these new aircraft swiftly and easily requires control cables of the utmost reliability, efficiency and endurance.

NEW COMMERCIAL JET-LINERS, as well as many military aircraft, are flying now with a unique remote control cable system made of special high-tensile wire wound around a stranded core with a heavy outer wire of stainless steel wound to a pitch of 10 per inch. This outer wire acts as a helix to engage hobbed wheels within the various system control boxes.

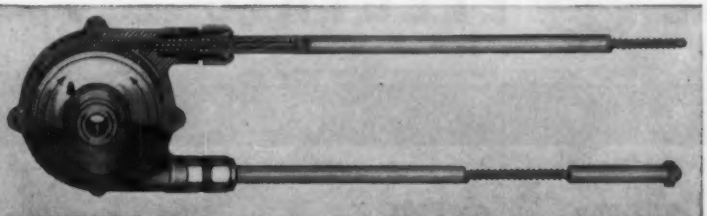
NATIONAL-STANDARD ENGINEERS worked closely with a control-cable system manufacturer to develop wire of just the proper alloy and rugged physical properties required to withstand extreme temperature and flight stress variations. National-Standard submitted wire samples to microstructural studies and physical tests to assist the customer in determining the conditions that would allow bending cable around pulleys without giving a permanent set to the cable. In addition, alloy steels with various coatings were tested to improve wear and galling resistance for various applications. The result was the development of a special stainless-steel wire that exceeded rigid specifications.

EXPERIENCED ENGINEERING HELP, of this kind, for jobs requiring high-quality wire to meet special or unique applications, is available to *you* from National-Standard. For any of the many thousands of applications where only special wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

Manufacturer of specialty wire and metal products

NATIONAL STANDARD

DIVISIONS: NATIONAL STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS,** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY,** Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL,** Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE,** Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS,** Carbondale, Pa.; decorative, commercial, and industrial perforated metals.



FLEXIBLE CABLE engages accurately with specially hobbed wheels housed in control boxes. This combination requires special cable wire that will not take permanent set and will provide smooth, hard bearing surface for cable inside conduit.

NATIONAL-STANDARD engineers made intense microstructural and tensile studies of sample wire to find exact physical properties of the alloy to meet strict aircraft control specifications.

GENERAL ELECTRIC ANNOUNCES . . .

NEW POLYDYNE* DRIVE

The Modern Mechanical Way to Obtain Adjustable Speed at Low Cost

General Electric's new Polydyne drives give you low-cost adjustable speed straight from a-c power!

They're compact and versatile—available in configurations and ratings to meet virtually all adjustable-speed requirements!

Polydyne drive versatility is further increased by the number of mounting positions possible, by choice of remote controls, and by speed control and conduit box location.

POLYDYNE DRIVES SUPPLY CONSTANT TORQUE and respond smoothly to load changes. New control design prevents any binding or sticking of speed control mechanisms. All units have been factory and field-tested to help assure dependable operation over long periods of continuous service.

EASY MAINTENANCE. Belt changing is a simple job, and fast! Advanced design reduces possibility of damage to drive shaft and bearings during belt change, and eliminates shaft realignment problems after change.

General Electric Polydyne drives require minimum lubrication, and helical reducer gears can be removed as a unit for easy inspection, service.

Polydyne mechanical adjustable-speed drives can help you boost production by enabling you to:

1. Get the most effective process speed.
2. Get maximum machine life.
3. Adapt machine speed to operator ability.
4. Obtain maximum machine versatility.
5. Synchronize multiple processes.

POLYDYNE RATINGS—¼ to 25 hp, a-c; output speeds 4200 to 5 rpm; frame sizes 1 to 5; speed variations of 2/1 to 10/1 (depending upon frame).

GEAR REDUCTIONS—Single, double, triple and right-angle shaft.

ENCLOSURES—Dripproof and totally enclosed drives.

CONTROLS—Mechanical, manual or remote; electrical pushbutton remote; pneumatic or hydraulic remote.

ACCESSORIES—Remote control with tachometer speed indicator, brakes and slide rails.

CONFIGURATIONS—Upright, horizontal, C, Z, and 45°, geared and non-geared. Non-motorized units also available.

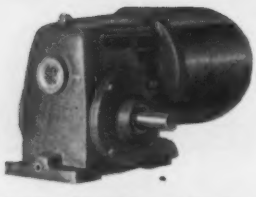
FOR MORE DETAILS and specifications on the complete General Electric PLUS LINE, including Polydyne, contact your nearby G-E Apparatus Sales Office or Distributor, or write for bulletins: Polydyne Drive (GEA-6806), G-E Helical Gear Motor Line (GEA-6704), Shaft-mounted Speed Reducers (GEA-6616), Fractional Horsepower Gear Motors (GEA-6133A), Section 854-1, General Electric Co., Schenectady, N. Y.

*Trademark of General Electric Co.

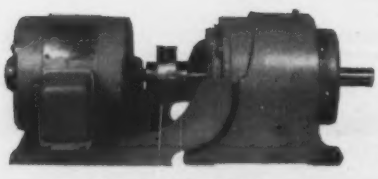
Progress Is Our Most Important Product

GENERAL ELECTRIC

CHOOSE FROM GENERAL ELECTRIC'S **PLUS LINE** OF



Right-angle shaft gear motor



All-motor gear motor

Offset-shaft gear motor

General Electric Polydyne is a complete "packaged" drive consisting of a-c driving motor, belt transmission, output gearing and control.

NOW AVAILABLE FROM STOCK!

You get all these PLUS VALUES with General Electric Mechanical Power Transmission Equipment

1. **Product Application Service.** G-E engineers are available to help you analyze and select the right equipment for your job.

2. **Prompt Shipment.** Offered on all standard General Electric units—from distributor or factory stocks.

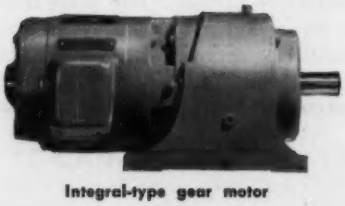
3. **Sales Service.** Your inquiries, quotations and requests for bids are handled promptly by G-E field service offices.

4. **After Sales Service.** 50 G-E Service Shops and 500 authorized Small Motor Service Stations offer expert repair service on all G-E Gear Motor products.

5. **Manufacturer Responsibility.** G.E. focuses manufacturing responsibility at one source, for it produces *all* gearing, components and motors included in its line.

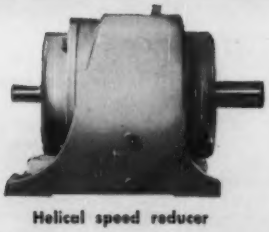
6. **Manufacturer Reputation.** Advanced technology built into G-E mechanical power transmission equipment assures you that it will meet your standards; adds value to and builds preference for your product.

MECHANICAL POWER TRANSMISSION EQUIPMENT



Integral-type gear motor

Shaft-mounted speed reducer



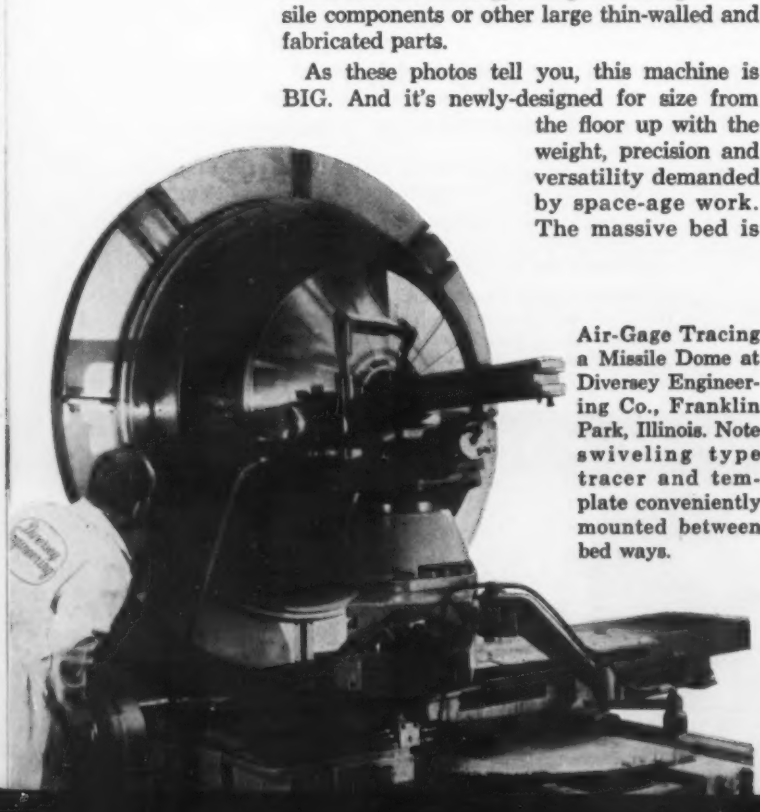
Helical speed reducer

Don't Tool Up

6 THE MISSILE MASTER—finest of the

This is *the* lathe for you—if you are interested in the contour turning, boring and facing of missile components or other large thin-walled and fabricated parts.

As these photos tell you, this machine is BIG. And it's newly-designed for size from the floor up with the weight, precision and versatility demanded by space-age work. The massive bed is 54" wide, with extra-wide, flame-hardened and ground carriage ways. And you can almost feel the strength in the specially-designed headstock, carriage, slides and tailstock.



Air-Gage Tracing a Missile Dome at Diversey Engineering Co., Franklin Park, Illinois. Note swiveling type tracer and template conveniently mounted between bed ways.

EXCLUSIVE PERFORMANCE FEATURES

The swiveling type Monarch Air-Gage Tracer generates complex shapes in an extreme contour range with an efficiency unequalled through any other means. Its unrivalled accuracy of reproduction is of the greatest value when working with high strength alloys, in complex thin-walled sections which must be machined to ultra-close tolerances and critical surface finishes. You'll like the template mounting between the bed ways. This permits easy adjustment from the front of the machine. Template tool control is possible over work diameter variations up to 70".

Large diameter work requires low spindle speeds. Augmenting the spindle drive, the time-proved, exclusive Monarch face plate drive assures full power applied far out from the work axis. This also widens the speed range, affording a choice of 24 speeds. Constant surface cutting speed control over a 4 to 1 range is available.

for Tomorrow's Boom with Yesterday's Lathes

MONARCH SPECIAL PURPOSE LATHES OF TOMORROW

The Monarch Missile Master. Swing over ways, 80"; swing over cross slide, 67". Length between centers in increments of 48", up to 300".

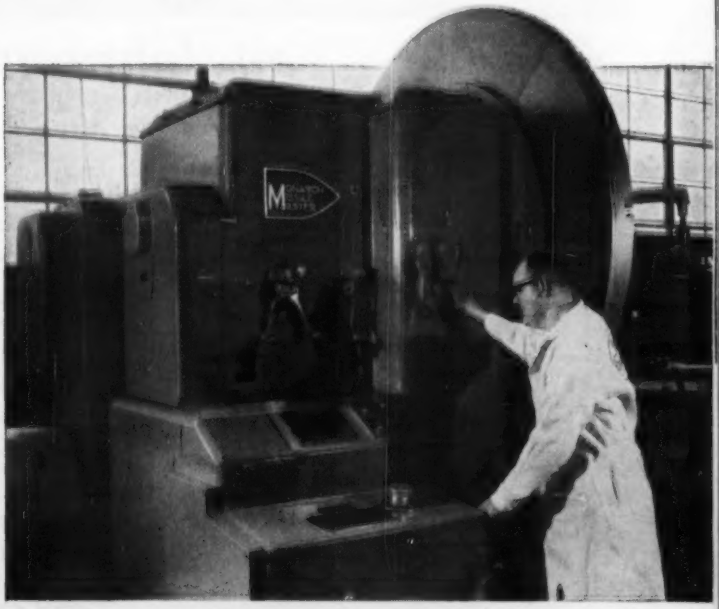
space-age giants—*New from the floor up*

CHECK THE FIELD

We invite your comparison of the Missile Master to any other lathe that might be considered in its class. Send for our Specification Brochure #2101. Then—if you really want to get your space-age work off the ground—make floor-space for the Missile Master! . . . The Monarch Machine Tool Company, Sidney, Ohio.

MISSILE MASTER APPLICATIONS

Missile Parts: Nose sections, nozzles, motor cases, bulkheads, air frame sections, hemispherical or elliptical domes.
Other Parts: Any large, thin-walled and fabricated parts: rolls, cylinders, spiders, jet engine components, valve gates, electrodes, etc.



We Don't Expect a Boy to Do a Man's Work! Look at that massive face plate drive headstock. Gear box is totally enclosed as you would expect on a modern lathe.

Monarch
TURNING MACHINES

IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER

at Johnson's Machine Company

. . . with the help of the Ætna Life's Business Planning Department

When Fred Johnson died last year his thriving machine shop didn't have to go out of business . . . experienced no down time . . . because Mr. Johnson was a progressive and foresighted man.

With the help of his Ætna Life representative, attorney and accountant, he set up a plan which gave his wife in cash the full going concern value of the business. This same plan provided for a smooth transition of the ownership to two of his key employees – avoided financial chaos in the business and disaster to his own family.

If you own or operate any kind of business, it will pay you to investigate the vital need for a business continuation plan – and no one is better equipped to serve your interests than the Business Planning Department of your local Ætna Life General Agency.

ÆTNA LIFE
INSURANCE COMPANY

Affiliates: Ætna Casualty & Surety Co. • Standard Fire Insurance Co. • Hartford, Conn.

The refractory aluminum can't lick!

...CRYSTOLON* Silicon Carbide

Impact on a charging hearth . . . a surge of molten metal into a trough . . . attack by corrosive alloys, fluxes and slags . . . Norton CRYSTOLON Refractories stand up to *all* these rigors of aluminum melting and transfer operations. Their exceptional stamina and stability not only protect purity throughout critical processing but also sharply reduce refractory maintenance.

Small wonder. CRYSTOLON Refractories are the most resistant to corrosion and erosion of all known refractories — and they offer outstanding mechanical strength and the highest resistance to thermal shock.

Ideal for use at all key melting, holding and transfer points, CRYSTOLON Refractories are specifically recommended for reverberatory and induction type furnaces. On the melting hearth, in the hot wall, in the holding hearth, and in many other critical areas, they assure longer refractory life . . . cleaner metal, free from refractory inclusions. What's more, CRYSTOLON Refractories are not wet under these corrosive conditions. Refractory surfaces stay clean longer . . . last longer.

Use these versatile refractories wherever aluminum could cause costly trouble . . . wherever contamination is a threat: in melting areas, launders, spouts and simple valves . . . for tap blocks and stopper rods. Take full advantage of today's high purity pig . . . *protect* purity during *your* operations. Reduce your reject losses with Norton CRYSTOLON Refractories. Several types are available to meet your precise requirements: oxide-bonded CRYSTOLON "G"; nitride-bonded CRYSTOLON "N" and recrystallized CRYSTOLON "R" Silicon Carbide. For complete details, write NORTON COMPANY, Refractories Division, 207 New Bond Street, Worcester 6, Mass.

NORTON PRODUCTS

Abrasives • Grinding Wheels • Grinding Machines
Refractories • Electrochemicals

BEHR-MANNING DIVISION

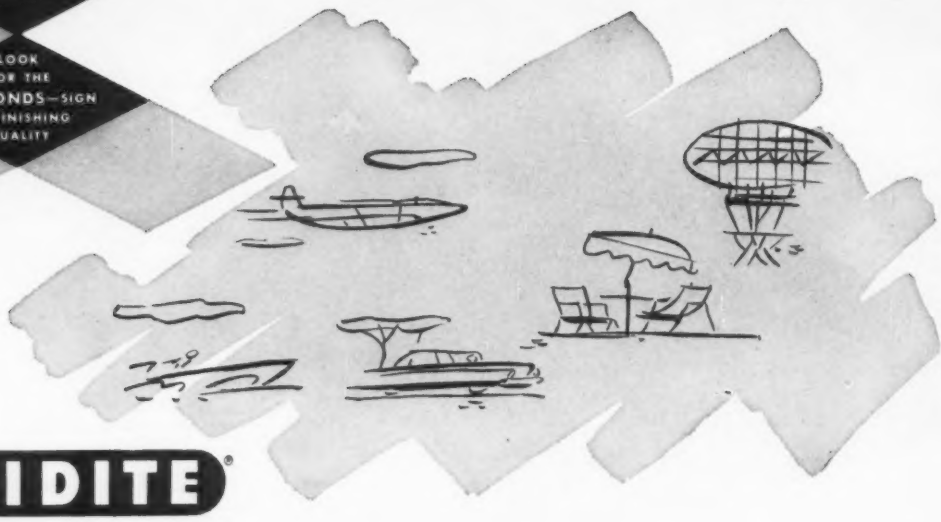
Coated Abrasives • Sharpening Stones
Pressure-Sensitive Tapes

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
REFRACTORIES
Engineered... Rx ...Prescribed

Making better products . . . to make your products better

LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY



Only IRIDITE®

Process Engineered

Chromate Conversion Coatings

Give you 5 additional benefits for Corrosion Protection—Paint Base—Decorative Finishing

1 A COMPLETE PROCESS ENGINEERED LINE

Developed for specific applications, there is an Iridite to provide the finish you desire, fit the equipment you have available and give the performance you require. Most Iridite coatings meet rigid military and civilian specifications.

2 EXPERIENCED TECHNICAL SERVICE

Our large field engineering staff is thoroughly familiar with chromate conversion coatings and related finishing operations. They'll help you check every step in your finishing operation to make sure you're getting the best possible finish on your products.

3 PRODUCT AVAILABILITY

Warehouses located in strategic industrial areas enable us to provide you with fast, economical delivery on any Iridite.

4 ECONOMY

The superior performance of Iridite provides low final cost by extending operating life and lowering maintenance costs. In addition, Iridite gives you a finish that adds considerably to the value of your product. There's an Iridite to meet every cost and performance requirement.

5 RESEARCH AND DEVELOPMENT FACILITIES

If you have an unusual application, we will gladly work with you. Our entire staff of experienced engineers and chemists, and our completely equipped facilities are at your service.

IRIDITE—a specialized line of chromate conversion coatings for non-ferrous metals. Apply by dip, brush or spray methods — at room temperature — manually or with automatic equipment. Forms a thin film which becomes an integral part of the metal. Cannot chip, flake or peel. No special equipment, exhaust systems or specially trained personnel required.

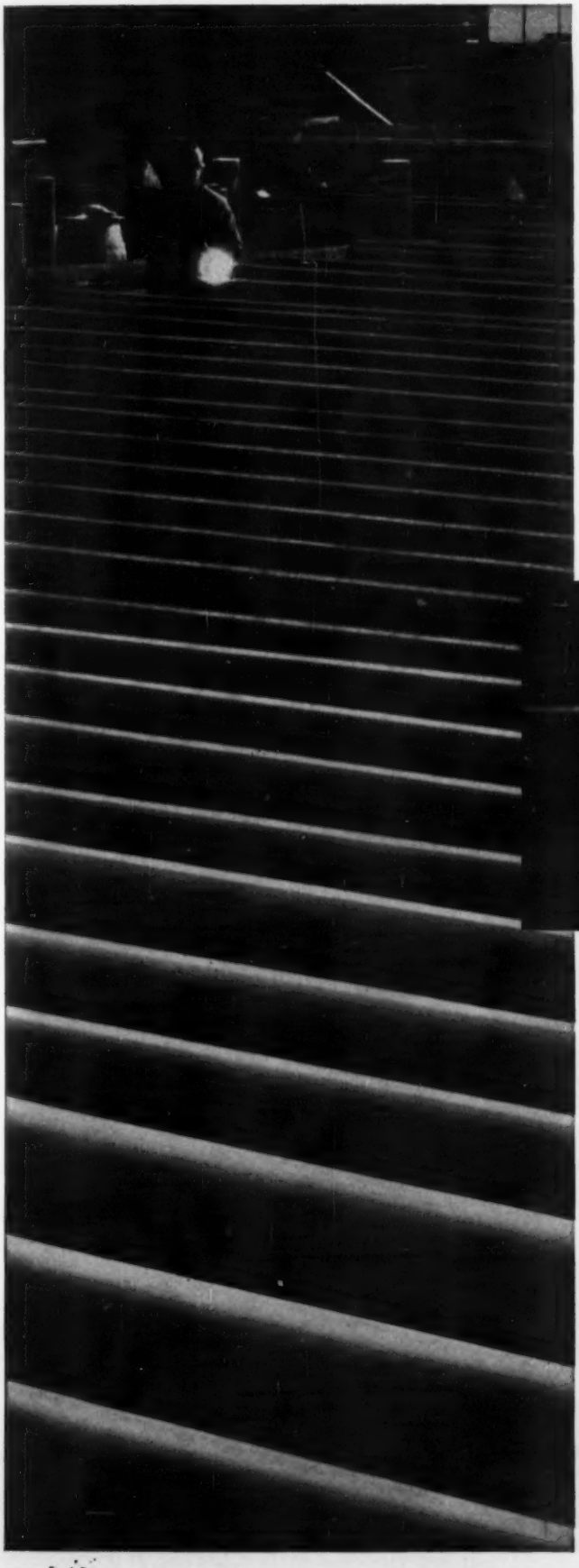
If you are using chromate conversion coatings to finish zinc, cadmium, aluminum, magnesium, silver, copper, brass or bronze — consider the above benefits of Iridite. For complete information, contact your Allied Field Engineer. He's listed under "Plating Supplies" in the yellow pages. Or, write for FREE TECHNICAL DATA FILE.

Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET • BALTIMORE 5, MARYLAND
BRANCH PLANT: 400 MIDLAND AVENUE • DETROIT 3, MICHIGAN
West Coast Licensee for Process Chemicals: L. H. Butcher Co.

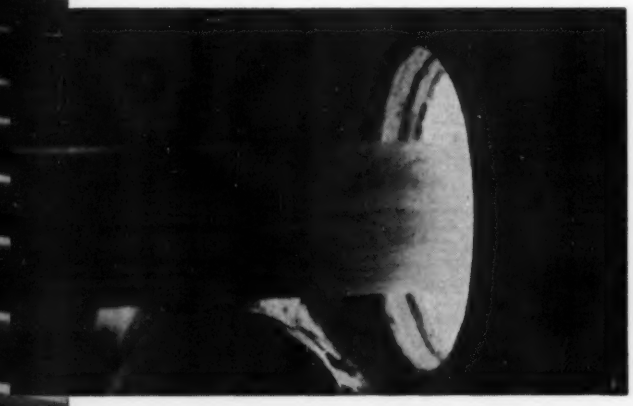
Chemical and Electrochemical Processes, Anodes, Rectifiers Equipment, and Supplies for Metal Finishing

IRIDITE® Chromate Coatings | IRILAC™ Clear Coatings | ISOBRITE® Plating Brighteners | ARP® Chemicals & Supplies | WAGNER Line of Equipment



"GAS gives us the controllability, cleanliness, economy and speed we demand"

A. O. Smith Corporation



Lengths of oil well casing are in production at the A. O. Smith Corporation in Milwaukee. They are being stress relieved in a gas furnace.

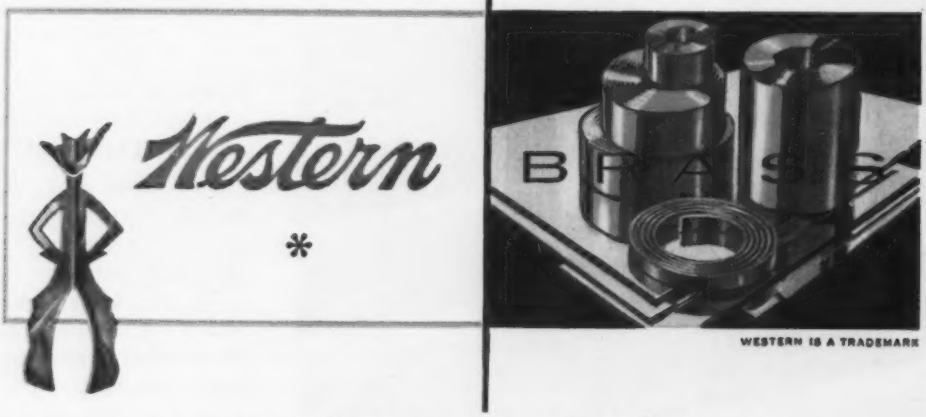
Gas has proved best on A. O. Smith's production line because of its cleanliness, controllability, speed and economy. Gas gives nearly 50% reduction in cost over their previous fuel, and carbon spots have been eliminated. There are three pre-heat furnaces that heat the pipe to 1650°-1750°, depending on the size of pipe. Three re-heat furnaces bring the temperature back up before quenching.

A. O. Smith also produces auto frames, pressure vessels, glass lined farm storage units and tanks, glass-lined gas water heaters and furnaces. Throughout their operations, gas is installed as an integral, indispensable part of their production lines.

For information on how gas can help you in your production operations, call your gas company's industrial specialist. He'll be glad to discuss the economies and superior results you get with modern gas industrial equipment. *American Gas Association.*

BRASS

...especially Western Brass...
has done...is doing...
and will do...many jobs better than
any other metal. Western Brass
is "tailor-made" for
each job.



WESTERN IS A TRADEMARK

* Sheet and Strip Specialists in Brass and Copper *

The man from Western is only a phone call away

OLIN MATHIESON CHEMICAL CORPORATION
Western BRASS

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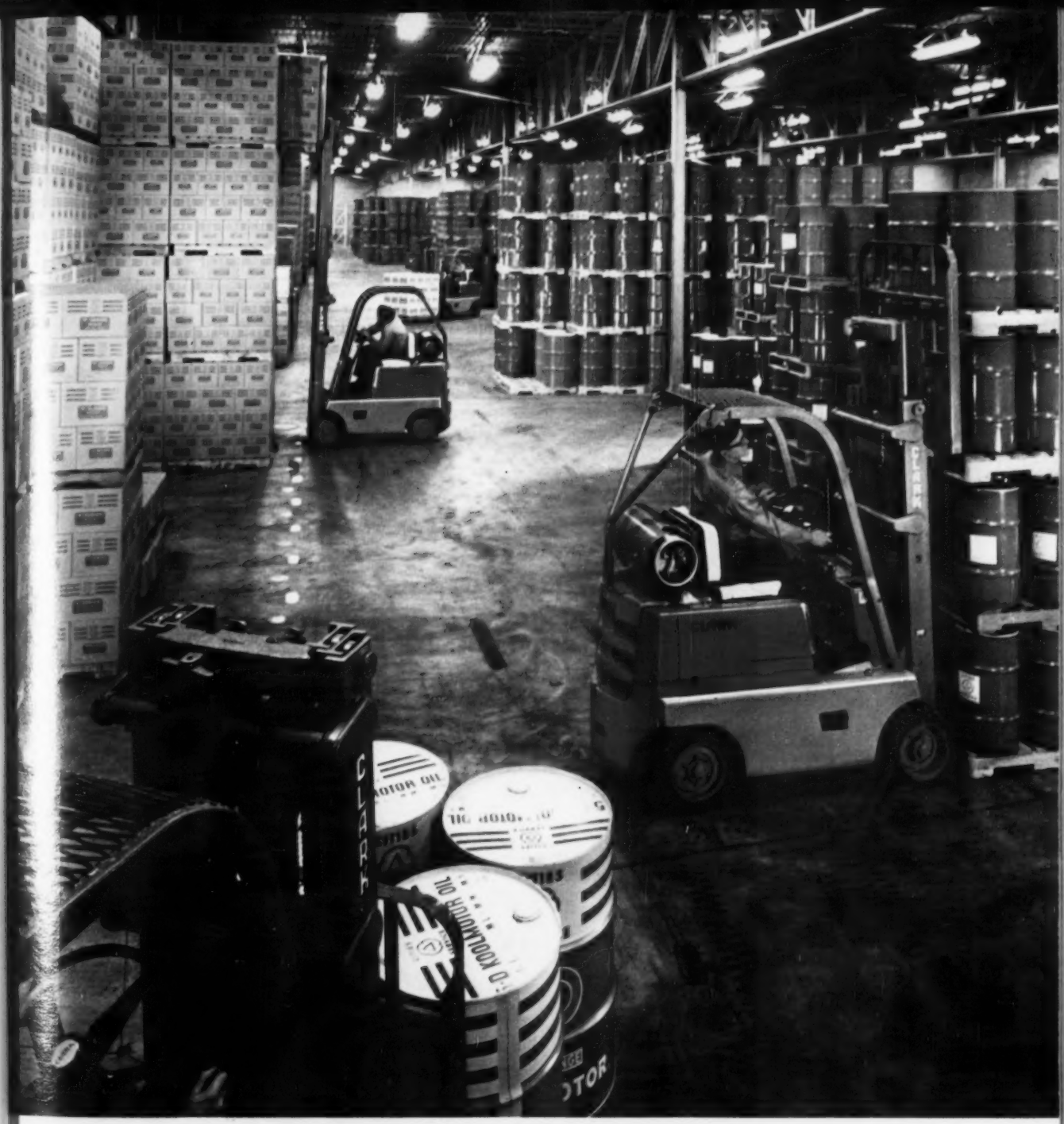


You're paying for new trucks...why not own them?

Times change. So does equipment efficiency. The new *Clarklift* fork trucks pictured above, for example, have been tested and proved to be 30% more efficient than the average truck in use today. Over four years of designing, testing, and field-proving has demonstrated time and again that *Clarklift* owners get a fast return on their investment in extra production alone.

And, of course, if you have old equipment, there's the high cost of maintenance to consider. If your present trucks are frequently down for repairs, you're paying dollars not only for the parts and labor involved, but you're also paying for lost production, supply and shipping bottlenecks, poor use of manpower. It all adds up. It means you're paying for new equipment every day . . . *but without owning it.*

A planned equipment replacement program is worth investigating. Simply write: Planned Replacement, Clark Equipment Company, Battle Creek, Michigan. We'll arrange to have a representative call to survey your operation and explain the various programs available.

CLARK® EQUIPMENT

CLARKLIFT is a trademark of Clark Equipment Company

U. S. A.

Physical tests at Standard include those for special properties of steel alloys under extreme variations in temperature. Here, the strength and ductility of steel are being checked for resistance to stress under severe conditions of elevated temperatures over a prolonged period of time.

Charpy impact and transition temperature determinations have recently assumed importance in many applications. Here a steel sample is immersed in liquid nitrogen to determine its susceptibility to fracture at temperatures as low as —300°F.

Quality control—a vital activity at Standard Steel Works

Every conceivable shop and laboratory test required for modern quality control can be performed by Standard's staff of metallurgical technicians. Testing of incoming raw materials; physical property tests of steel and other alloys at temperatures from several hundred degrees below zero up to red heat; gas analysis, ultrasonic, X ray, magnetic particle, fluorescent penetrant and microscopic examination of finished products are routine checks which assure that the finished, delivered product will meet the most rigid specifications. Write Department I-H for full details.

Standard Steel Works Division

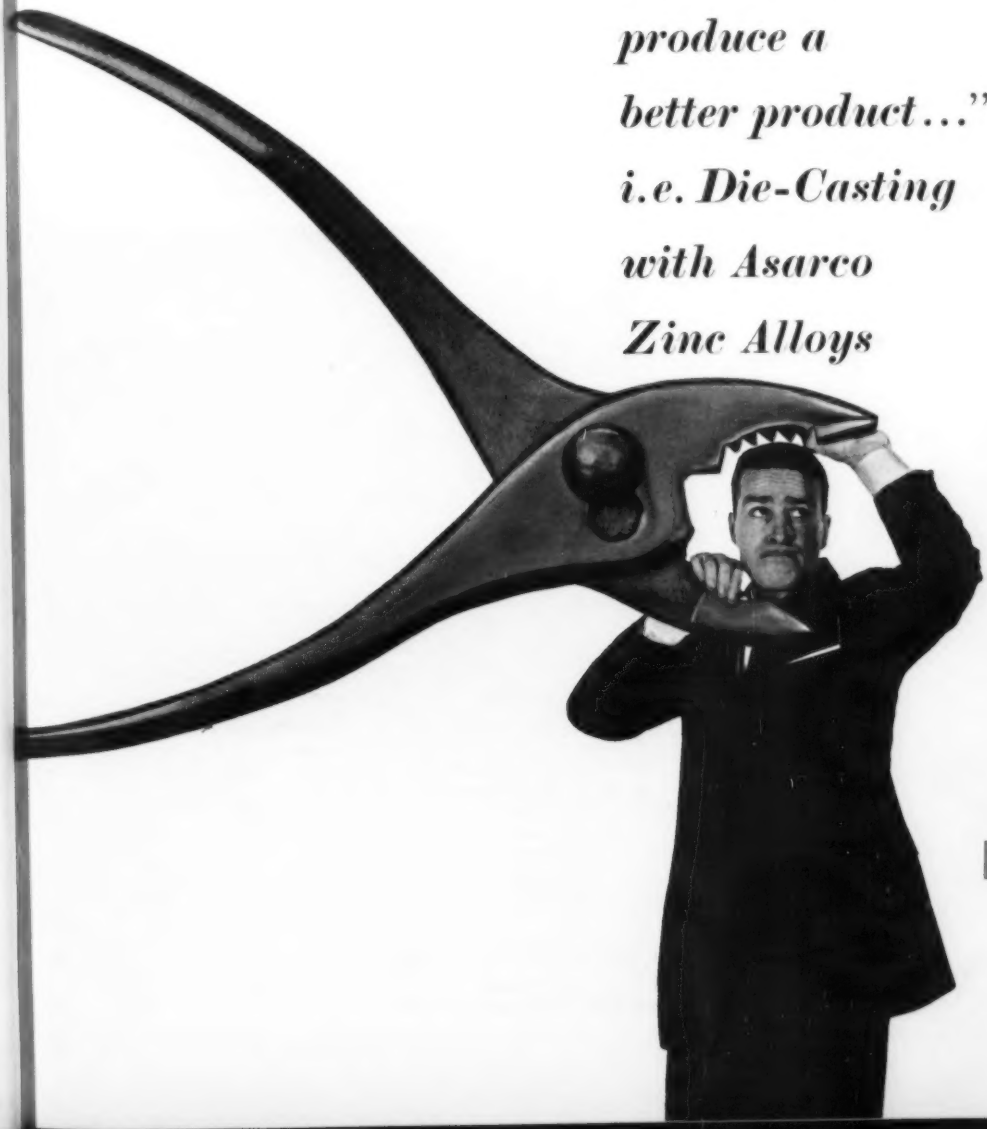
BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

ASARCO

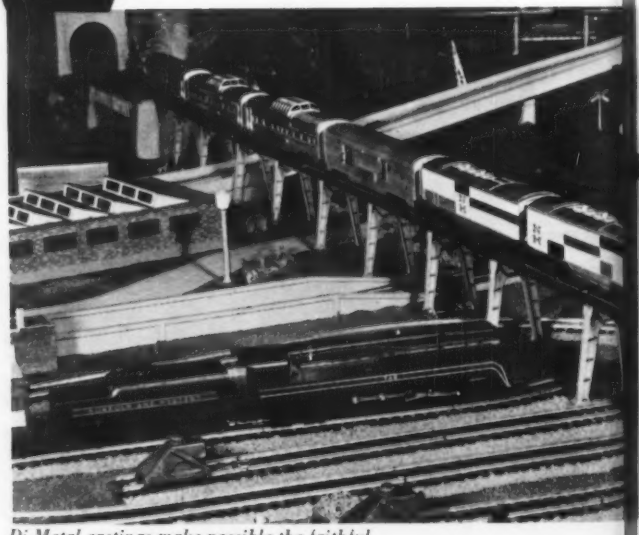
"the fast way out of today's profit squeeze is through the use of more efficient materials which cost less to machine and fabricate, yet produce a better product..."
i.e. Die-Casting with Asarco Zinc Alloys



SEE NEXT PAGE

Die-Casting with Asarco's Federate D

Low machining costs, superior castability, and an excellent plating surface are the big reasons why Di-Metal castings are favored for fuel pumps, carburetors, grilles, lamp housings, instrument panels, horn rings, and many other functional and decorative automotive components.



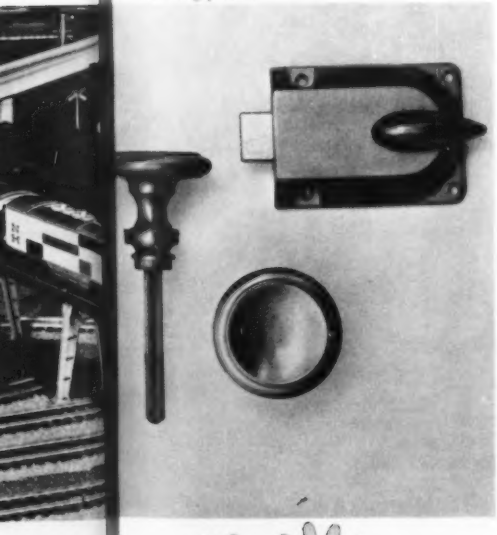
Di-Metal castings make possible the faithful reproduction of detail that's so important in producing trains and other toy miniatures which look "just like the real thing."

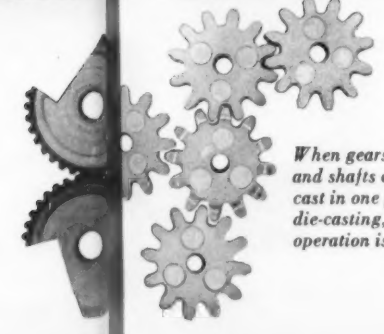
The low cost, fine detail, complex shapes, and brilliant finish possible with zinc die-casting has become increasingly appealing to manufacturers of costume jewelry.

rate Di-Metal Zinc Alloys *can cut your costs...and produce a better product in the bargain!*

Every designer will sit up and take notice when he sees how easy it is to produce miniature objects with movable parts, even linkage, in one Di-Metal zinc casting. This is actual size of die-cast scissors.

Zinc die-casting provides the hardware field with the smooth cast surfaces so necessary in producing an attractive, lasting finish.





When gears, cams, hubs, and shafts can be integrally cast in one piece by zinc die-casting, a costly assembly operation is eliminated.

There's a big swing in metal parts production today to die casting with zinc—and it certainly makes good sense.

For one thing—Federated Di-Metal (alloyed from Asarco's Special High Grade Zinc 99.99 plus % pure) is lower in material cost.

But the big savings come in production. The low melting point of Federated Di-Metal cuts casting time to the bone. Die casting at lower temperatures calls for less expensive dies—and they last far longer.

Castings can be held to very close dimensional tolerances so that there's a minimum of machining and finishing. And even when this is necessary, highly ductile zinc is easy to work.

Die casting with Federated Di-Metal can produce the most complex shapes, the thinnest section walls, the smoothest casting surfaces. The castings have impact strength and other mechanical properties superior to other casting metals (with the possible exception of copper which, of course, costs more). And zinc die-castings can be readily electroplated or coated.

When you're both cost and quality conscious, you can't afford to by-pass die casting with Federated Di-Metal. It is proving the fastest way out of the present "profit squeeze" for a growing list of manufacturers in many fields.

When You Die-Cast Your Product with Asarco's Federated Zinc Di-Metal, You Profit from:

1. Integrated Production. Federated Di-Metal is alloyed using electrolytically refined Special High Grade Zinc from ores mined by Asarco. Alloys are produced "under one roof" at Corpus Christi, Texas, one of the world's largest electro zinc producing plants – assurance of highest purity and uniformity at lowest cost.
2. Nation-wide Service and Distribution. Always a Federated field engineer near you, on call from 23 sales offices throughout the country. Federated Di-Metal is stocked for immediate shipment from a nation-wide system of distribution centers.
3. Asarco booklets and bulletins of great working assistance to the die casting industry, detailing efficient working practices, selection of alloys, vital technical data. Write for your free copy of "For Better Die Castings," to your nearest Federated Sales Office or to ASARCO Federated Metals Division, 120 Broadway, New York 5, New York.

ASARCO

AMERICAN SMELTING AND REFINING COMPANY

Other ways it pays to THINK ZINC when you're cost-and-quality conscious:

GALVANIZED STEEL. The strength of steel, the corrosion resistance of zinc—at low cost. New processing methods assure uniformly thick zinc coating. Galvanized steel can be drawn or formed. Roofing and siding sheets for farm and industrial buildings are low in initial cost, installation cost, and maintenance cost. Corrugated culvert pipe is easy to transport and install, flexible, strong, durable. Galvanized sheets are superior materials in heating and air-conditioning installations—cost less, fabricate more easily, are more rigid for longer unsupported spans, operate quieter since they expand and contract less than comparable materials.

Zinc products available from Asarco:

ZINC SLAB, Prime Western, Brass Special, Intermediate, High Grade, Special High Grade;
ZINC ANODES for cathodic protection of ship hulls and other submerged steel structures;
ZINC DUST, 97% metallic zinc, 97% through 325 mesh screen;
ZINC FOIL for barrier wraps, insulation;
ZINC ALLOYS for die-casting.

Federated Sales Offices

ALTON, ILLINOIS
Alton Phone: Alton 5-2511
St. Louis phone: Jackson 4-4040

BALTIMORE 24, MARYLAND
Highland & Eastbourne Aves.
Phone: Orleans 5-2400

BIRMINGHAM, ALA.
416 Dalton Drive
Phone: Fairfax 2-1802

BOSTON 16, MASS.
Statler Office Bldg.
20 Providence Street
Phone: Liberty 2-0797

CHICAGO, ILL. (WHITING)
123d St. & Indianapolis Blvd.
Chicago phone: Essex 5-5000
Whiting phone: Whiting 826

CINCINNATI, OHIO
1603 Carew Tower
Phone: Cherry 1-1678

CLEVELAND, OHIO
Hanna Building
1422 Euclid Avenue
Phone: Prospect 1-2175

DALLAS, TEXAS
Phone: Adams 5-5034

DETROIT 2, MICHIGAN
522 New Center Building
7430 2nd Avenue
Phone: Trinity 1-5040

EL PASO, TEXAS
1213 Mills Building
(Asarco Mercantile Co.)
Phone: 3-1852

HOUSTON 29, TEXAS
9000 Market Street Road
P.O. Box 24038
Phone: Orchard 4-7611

LOS ANGELES 23, CALIF.
4010 East 26th Street
Phone: Angelus 8-4291

MILWAUKEE 10, WIS.
4608 West Burleigh St.
Phone: Hilltop 5-7430

MINNEAPOLIS, MINN.
Phone: Tuxedo 1-4109

NEWARK, NEW JERSEY
150 St. Charles Street
Newark phone: Mitchell 3-0500
New York phone: Digby 4-9460

PHILADELPHIA 3, PENNA.
1107 Suburban Station Bldg.
Phone: Locust 7-5129

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615 Gross Street
Phone: Museum 2-2410

PORTLAND 9, OREGON
1900 N.W. 18th Avenue
Phone: Capitol 7-1404

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Triangle Building
335 East Main Street
Phone: Locust 2-5250

ST. LOUIS, MISSOURI
Mail Address: Alton, Ill.
Phone: Jackson 4-4040

SALT LAKE CITY 1, UTAH
700 Crandall Bldg.
Phone: Empire 4-3601

SAN FRANCISCO 24, CALIF.
1901 Army Street
Phone: Atwater 2-3340

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Phone: Main 3-7160

WHITING, IND. (CHICAGO)
123d St. & Indianapolis Blvd.
Whiting phone: Whiting 826
Chicago phone: Essex 5-5000

IN CANADA: Federated Metals Canada, Ltd.
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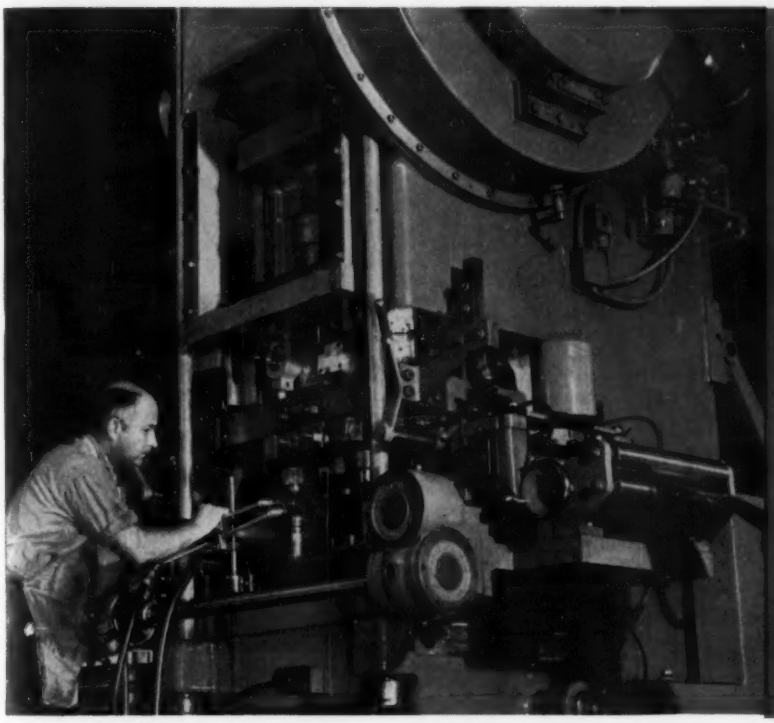
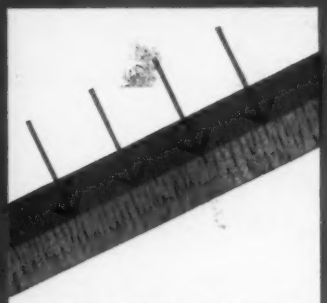
Montreal, P.Q., 1400 Norman St., Lachine, Phone: Melrose 7-3591

ASARCO

Better products, *faster*, from your National Seal specialist:





MICRO-TORC PROCESS penetrates *part way* to seal outside face; untreated side can absorb lubricant to keep leather flexible.

National deliberately does a "half-way" job on leather to make industrial oil seals better

National Oil Seals feature: 1. *Micro-Torc* process to seal in oil and grease, leave untreated side to absorb lubricant; 2. Minimum tension on garter spring to reduce shaft-torque, increase seal life.

Exclusive Micro-Torc process seals outside face . . . lets inside face absorb the lubricant a seal needs

Natural leather is too porous—must be processed to make it seal oil. So National does a "half-way" job on leather to make it seal better and last much longer.

Micro-Torc oil seals are impregnated part-way through. The coated side seals in oil or grease . . . seals out dirt, dust and water. The uncoated side remains naturally porous . . . absorbs lubricant to keep leather flexible in periods of "starvation." *Micro-Torc* seals run cooler, with less friction and less shaft wear. They last longer; save time and money on replacement.

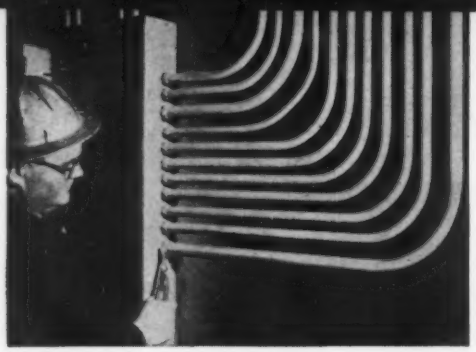
Your National Seal specialist gives fast delivery on a complete line of leather and synthetic rubber industrial oil seals. Call him today!

NATIONAL OIL SEALS

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN

NATIONAL OIL SEALS



At Detroit's Pavilion Apartments, Youngstown "Buckeye" Conduit is being attached to electrical control box.

Accent on Excellence

Youngstown "Buckeye" steel conduit

Detroit's new, modern-as-tomorrow Pavilion Apartments, designed by architect Mies Van Der Rohe, has lifetime electrical wiring protection —thanks to Youngstown "Buckeye" Rigid Steel Conduit.

Electrical systems that function improperly are a bad investment. To be sure your installations are both safe and efficient, always specify "Buckeye" Conduit. It's been the consistent choice of leading architects, contractors and building owners over the years.

When you specify "Buckeye" Conduit, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create electrical wiring systems with an "accent on excellence".

PAVILION APARTMENTS, DETROIT, MICHIGAN

OWNER:
Herbert S. Greenwald, Metropolitan Corporation of America, Chicago, Illinois

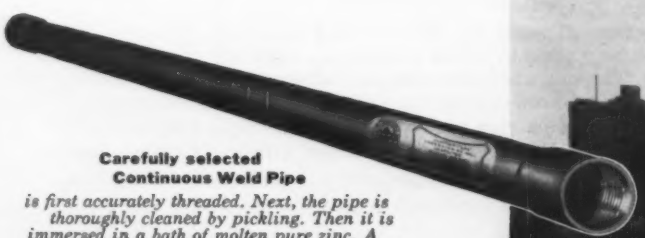
ARCHITECT:
Mies Van Der Rohe, F.A.I.A., Chicago, Illinois

GENERAL CONTRACTOR:
Herbert Construction Corp., Chicago, Illinois

CONSULTING ENGINEER:
William Goodman, Chicago, Illinois

ELECTRICAL CONTRACTOR:
Post Electric Co., Dearborn, Michigan

CONDUIT SUPPLIER:
Commerce Electric Supply Co., Farmington, Michigan



Carefully selected Continuous Weld Pipe

is first accurately threaded. Next, the pipe is thoroughly cleaned by pickling. Then it is immersed in a bath of molten pure zinc. A special process is used to remove it from this bath so that a clean, smooth zinc coating remains on both inside and outside. Then a coating of tough, transparent lacquer is baked on both inside and outside surfaces, providing a smooth raceway through which wires may be easily fished. This is Youngstown's long-lasting, trouble-free, easy bending hot galvanized Buckeye Conduit.

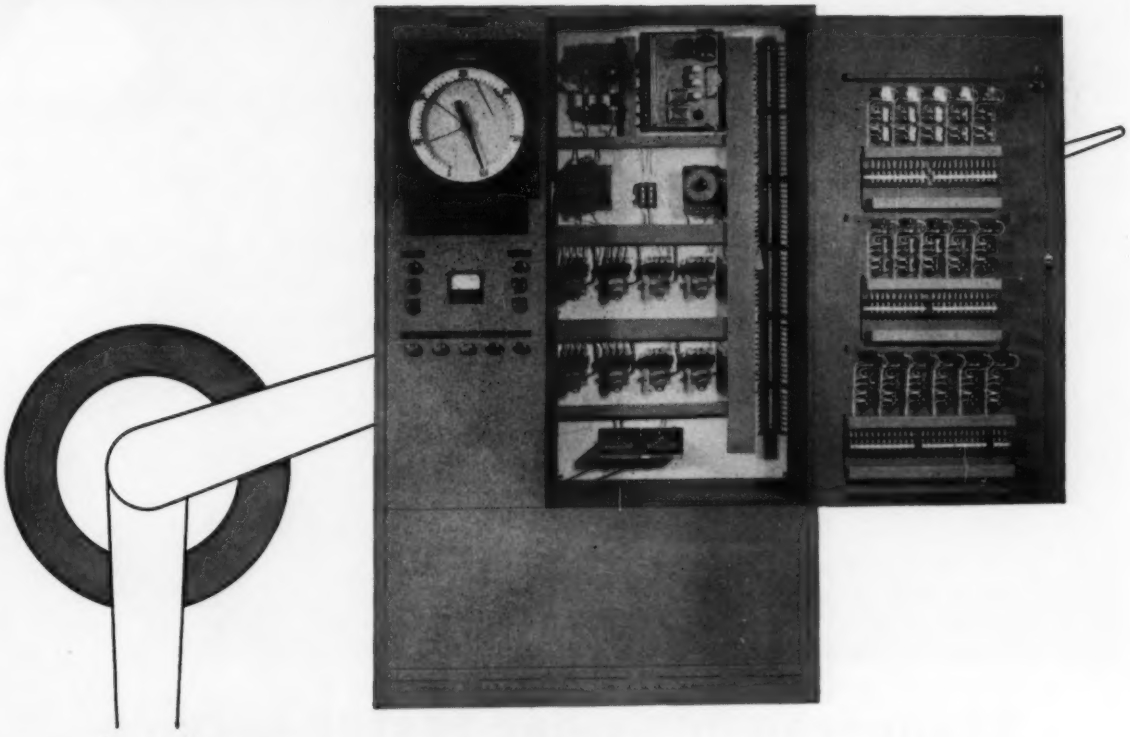
Scale model of new Pavilion Apartme

Youngstown
Youngstown, Ohio

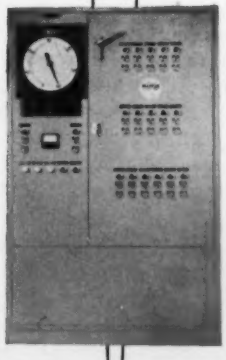
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Carbon, Alloy and Yoloy Steel

FINISHING SYSTEMS...



ENGINEERED for CONTROL, DEPENDABILITY, QUALITY and SAFETY!



A Modern Finish Baking Oven is not just an indiscriminate assembly of insulated panels, heating units, ducts, fans, blowers, motors, etc.

The Mahon Oven Control Panel, illustrated above, was engineered and built by Mahon for one Mahon Finish Baking Oven which was specially designed to meet the exacting requirements of a particular manufacturer. This is just one example of how each component is thoroughly engineered into Units of Mahon Finishing Equipment to insure quality construction throughout, functional dependability, positive control and maximum safety in operation.

If you are considering a new finishing system, or any unit of finishing or processing equipment, you will want to discuss your requirements with Mahon engineers . . . you'll find them better qualified to advise you on possible production layouts, and better qualified to do the initial planning and engineering which plays such an important role in the ultimate operating efficiency of specially designed equipment of this type.

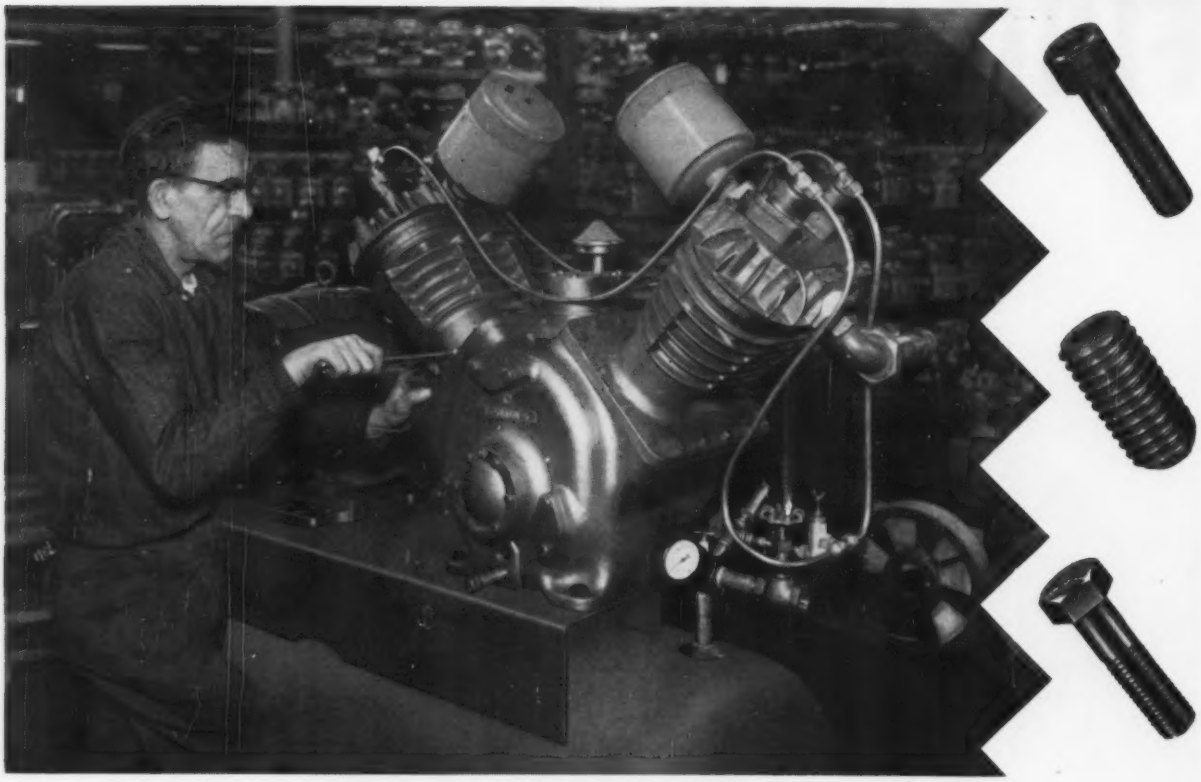
See Sweet's Plant Engineering File for Information, or Write for Catalogue A-659

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

. . . the **EXPERIENCE** that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

MAHON



Stanscrew provides faster service, adds safety for BRUNNER SINCE 1906 compressors

The fasteners this man is tightening must be really dependable. Dunham-Bush, therefore, maximizes the safety margin for its Brunner line by standardizing on Stanscrew heat-treated cap screws for all critical applications.

With tremendous production demands on its Hartford plant due to industry's preference for Brunner compressors, Dunham-Bush also demands a supplier who provides quick assistance on all occasions, and moves especially fast in emergencies. Stanscrew meets these requirements because complete stocks are maintained at three conveniently located plants . . . plus a management philosophy which looks on shipments within 24 hours as normal procedure, subject to drastic improvement in emergencies.

Fast delivery and reliable products are but two of many reasons more and more industrial leaders are switching to Stanscrew. A complete selection of over 5,000 different standard fasteners . . . experienced fastener specialists to provide qualified technical assistance . . . these and many other factors underline the advantages of specifying Stanscrew for your fastener requirements.

Why not call your Stanscrew distributor today. He will gladly arrange a prompt visit from the Stanscrew specialist who can often save you money . . . for example, by substituting a standard fastener for a costly special.

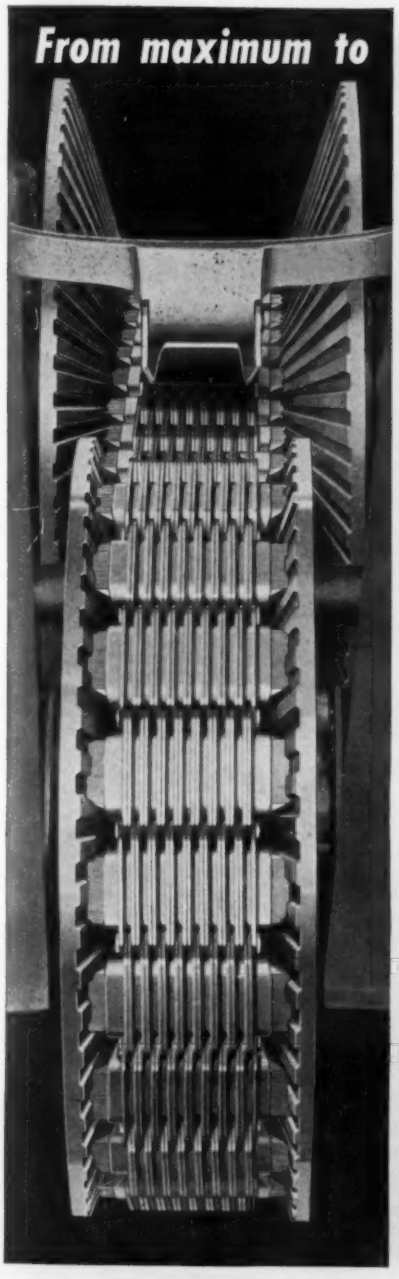
STANSCREW FASTENERS

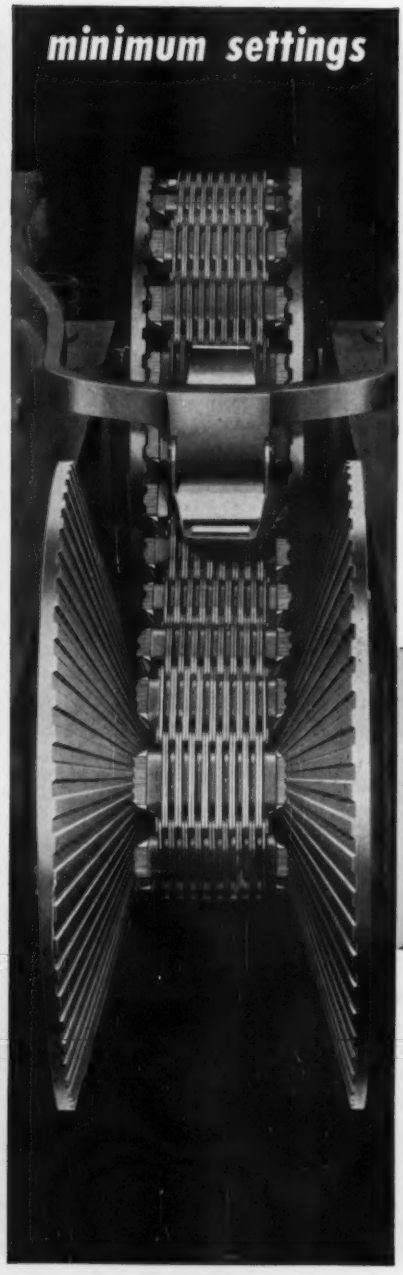
CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois

For positive, accurate speed control

...there's nothing like P.I.V.

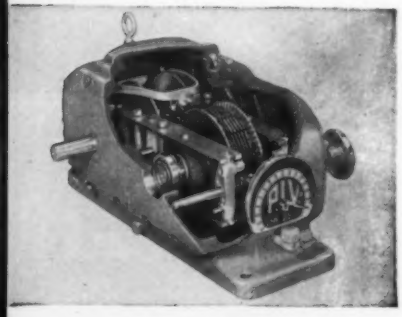




VARIABLE from top speed to minimum speed with no steps, no stops in between. That's Link-Belt P.I.V.—the *only* chain-driven variable speed drive. Teeth—not tension—permit instant ratio changes with no loss of speed, regardless of load conditions.

Slippage? Not a chance—P.I.V.'s chain-to-wheel grip is positive as a gear. In fact, this is industry's most accurate, most reliable mechanical variable speed drive.

Your Link-Belt office or authorized stock-carrying distributor has Book 2274 on P.I.V. drives from ½ to 25 hp. Refer to the yellow pages of your local phone directory under Power Transmission Equipment.



HOW P.I.V. WORKS. Exclusive self-tooth-forming chain of P.I.V. consists of packs of free-sliding steel slats which serve as teeth. Chain grips beveled grooves on pairs of conical wheels located on input and output shafts. Speeds are changed by varying the effective diameters of the wheels, as shown at left.

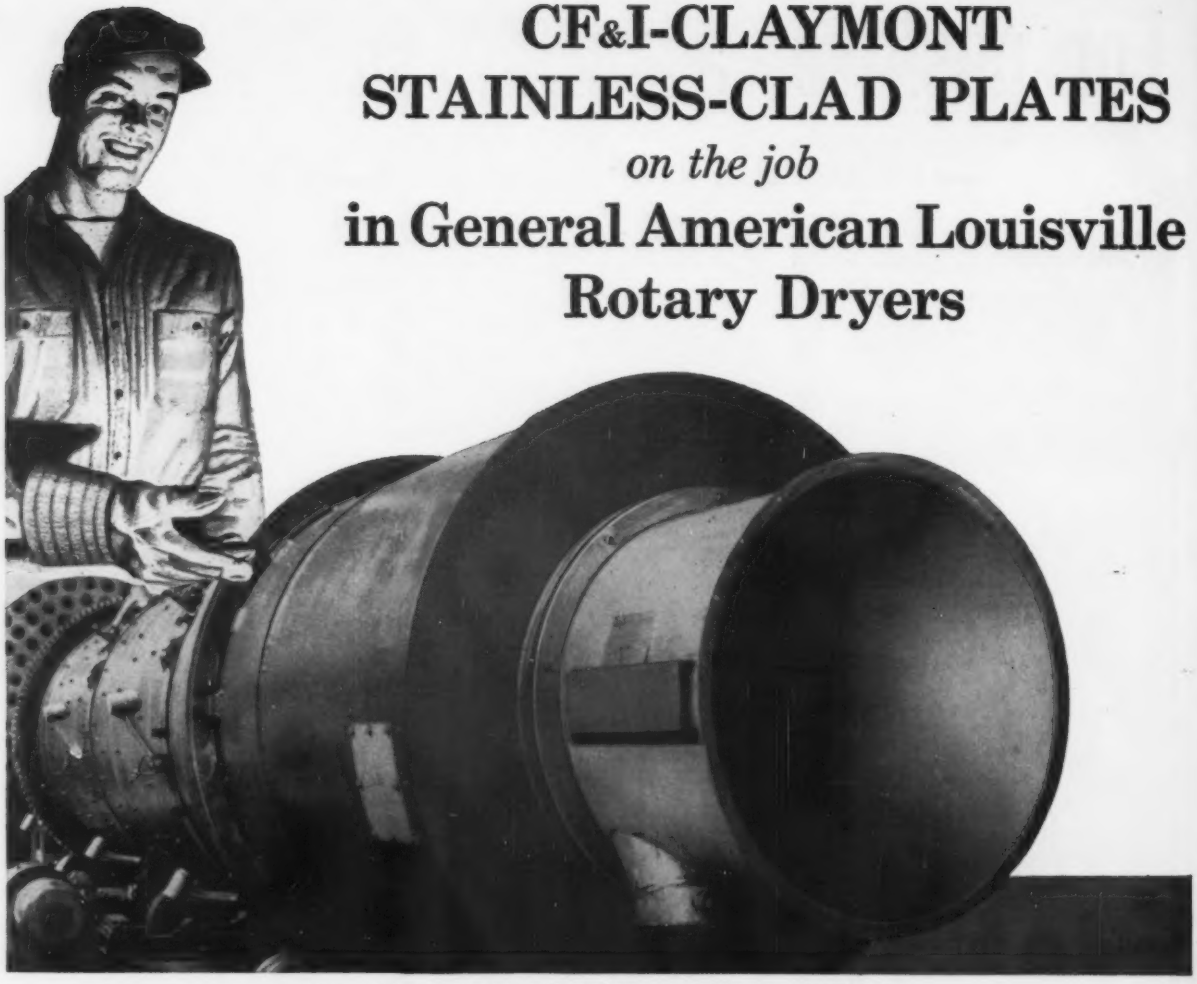
P.I.V. LINK-BELT VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Distributors in all Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickvills, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,813

CF&I-CLAYMONT STAINLESS-CLAD PLATES

on the job

in General American Louisville Rotary Dryers



This warm air dryer, built by the Louisville Dryer Division of General American Transportation Corporation, was fabricated from Claymont Stainless-Clad Steel Plates. The plates consist of a ¼" thick cladding of type 304 stainless, bonded to a 1" plate of flange-quality carbon steel.

The Image of CF&I reflects *customer satisfaction*. For instance, here's what one steel plate user says about a CF&I product made to meet his company's requirements:

"By using Claymont Stainless-Clad Steel Plate, we get the same protection afforded by stainless steel, plus the economies of carbon steel."

This statement was made by Mr. C. F. Spencer, sales engineer for the Louisville Dryer Division of General American Transportation Corporation. He goes on to say, "When dryer specifications require the elimination of corrosion-susceptible metals, or when engineers must provide protection against certain abrasive materials inside the drum, Claymont Stainless-Clad Plates are frequently specified."

In the manufacture of this CF&I-Claymont product, stainless steel claddings—in thicknesses from 5% to 50% of total plate gage—are inseparably bonded to carbon steel backing plates. Claddings are provided to ASTM A-263, A-264 and the following AISI Specifications: 304, 304L, 316, 316L, 316Cb, 321, 347, 405, 410 and 430. We also invite inquiries on other stainless specifications to meet your requirements.

Whatever the job, call Claymont when you're thinking of stainless-clad steel plate. Complete information and prompt service are yours, at the CF&I sales office nearest you.

CF&I-CLAYMONT PRODUCTS: Carbon Steel Plates • Alloy Steel Plates • CF&I Lectro-Clad Nickel Plated Steel Plates • Clay-Loy High Strength Low Alloy Steel Plates • Flanged and Dished Heads • Pressed Steel Shapes • Manhole Fittings, Covers and Saddles • Fabricated Steel Plate Products • Large Diameter API Pipe

Claymont Steel Products

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston Kansas City • Lincoln • Los Angeles • Oakland • Odessa • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita
In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CF&I OFFICE IN CANADA: Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

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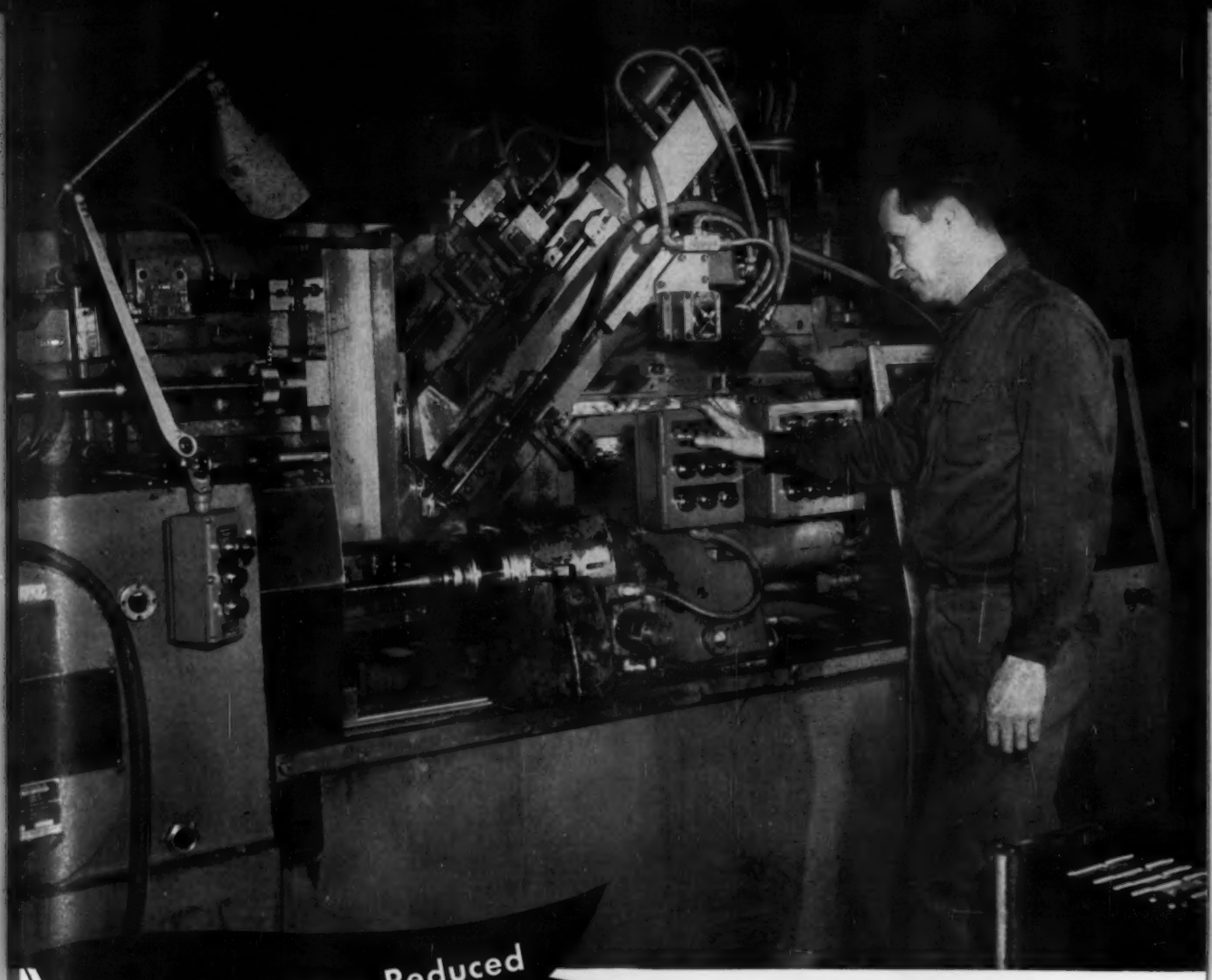


Machining Time Reduced Over **25%**

on Valve Bodies with . . . . .

BULLARD

HYDRA-FEED LATHE

This "dollars and cents" saving is made possible, according to the National Supply Company, Toledo, Ohio, manufacturers and distributors of oil field equipment and supplies, for the following reasons: Minimum set-up time; Rugged construction; Ease of operation and Flexibility of feed rates.

Further, they are completely satisfied with the Bullard Hydra-Feed and, if ordering another machine for the same job, would consider purchasing another Bullard Hydra-Feed Lathe.

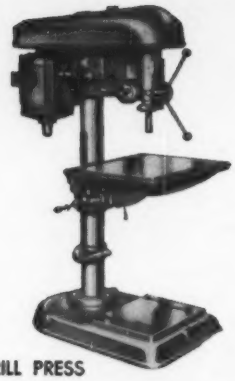
You, too, will share this enthusiasm for the Bullard Hydra-Feed Lathe — ask your Bullard Sales Engineer, Distributor or write for full information to

THE BULLARD COMPANY

BRIDGEPORT 9, CONN.

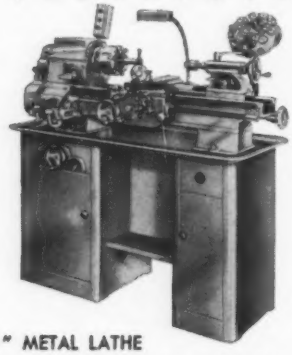
7" GRINDER
Also 6" Tool Grinder, 6" Bench Grinder

14" METAL-WOOD BAND SAW
Also 20", 14" and 20" Wood



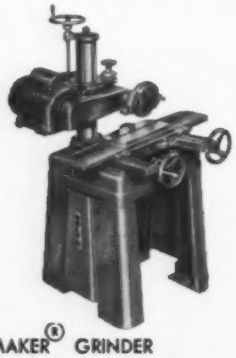
17" DRILL PRESS

6" ABRASIVE BELT FINISHING MACHINE
Also 12" Disc, 2½" Belt Grinder

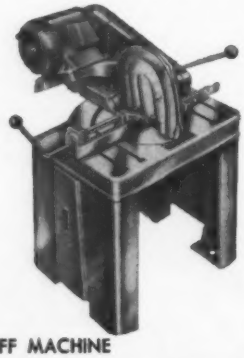


11" METAL LATHE
Also 10" and Hand Screw Machine

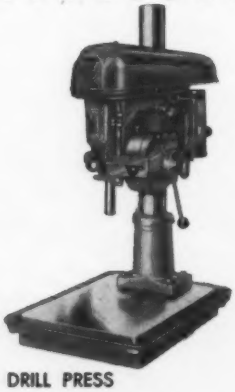
15" DRILL PRESS
Also 14" and 14" Super-Hi Sensitive



TOOLMAKER® GRINDER
Surface, Chipbreaker, Tool and Cutter



CUT-OFF MACHINE
Wet & Dry Abrasive, Non-Ferrous & Wood



20" DRILL PRESS

DELTA INDUSTRIAL TOOLS

a proved way to cut metalworking costs

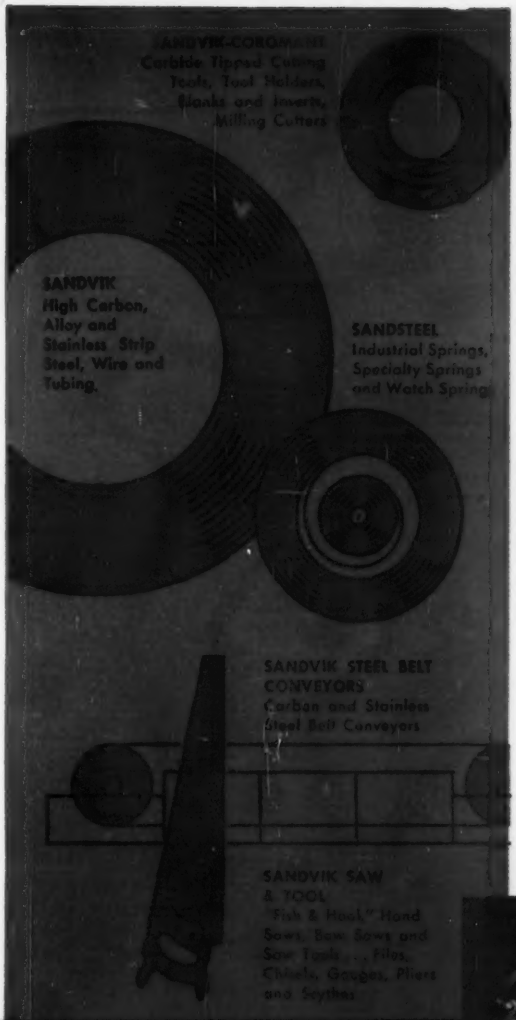
You can match the tool to your job for bigger savings—supplement or replace expensive, special-purpose machines—when you choose from the world's most *complete* line—53 Delta machines, 246 models, over 1300 accessories. Delta tools cost less to buy, less to operate, and less to maintain. They offer precision performance to meet exacting requirements even under rugged, production-line use.

And because you can combine standard Delta components with automatic control devices, you can have the money-saving advantages of automation at a fraction of the usual cost. Ask your Delta Dealer about Delta "lo-cost automation"—and see the complete Delta line of tools and accessories—he's listed under "TOOLS" in the Yellow Pages.

FREE—Delta Industrial Catalog

Get all the facts on the complete line of Delta metalworking and woodworking tools and accessories. Write: Rockwell Manufacturing Co., Delta Power Tool Division, 640 H N. Lexington Ave., Pittsburgh 8, Pa.

DELTA INDUSTRIAL TOOLS
another fine product by
ROCKWELL


SANDVIK-COROMANT
Carbide Tipped Cutting Tools, Tool Holders, Blanks and Inserts, Milling Cutters
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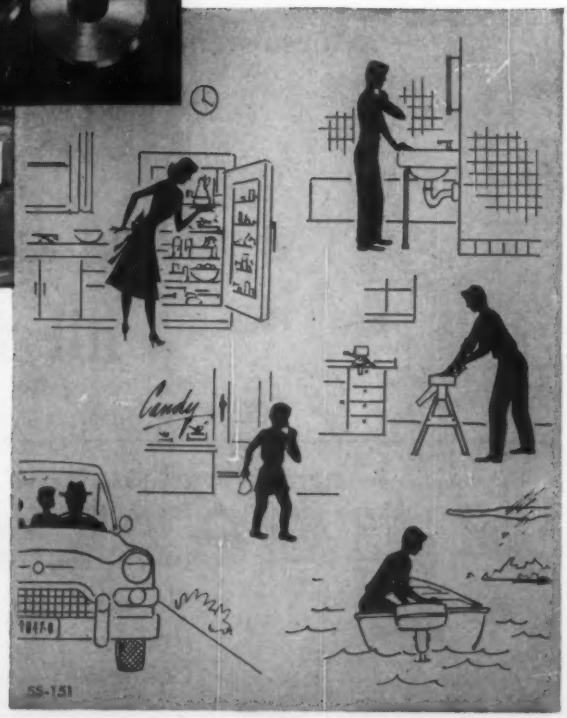
"Fish & Hook" Hand Saws, Bow Saws and Saw Tools . . . Files, Chisels, Gauges, Pliers and Scythes

SANDVIK QUALITY PRODUCTS

Serve Millions Of Americans

In razor blades and refrigerators, in clocks and cars, in hand saws and industrial tools, in chemicals and candy... almost anywhere you look, Americans use Sandvik products.

From coast to coast, Sandvik's consistent product quality and specialized service benefit both industry and the individual consumer. That's the reason why Sandvik has been growing with America since 1878.



SANDVIK STEEL, INC.

1702 Nevins Road, Fair Lawn, New Jersey

Branch Offices: Cleveland • Detroit • Chicago • Los Angeles

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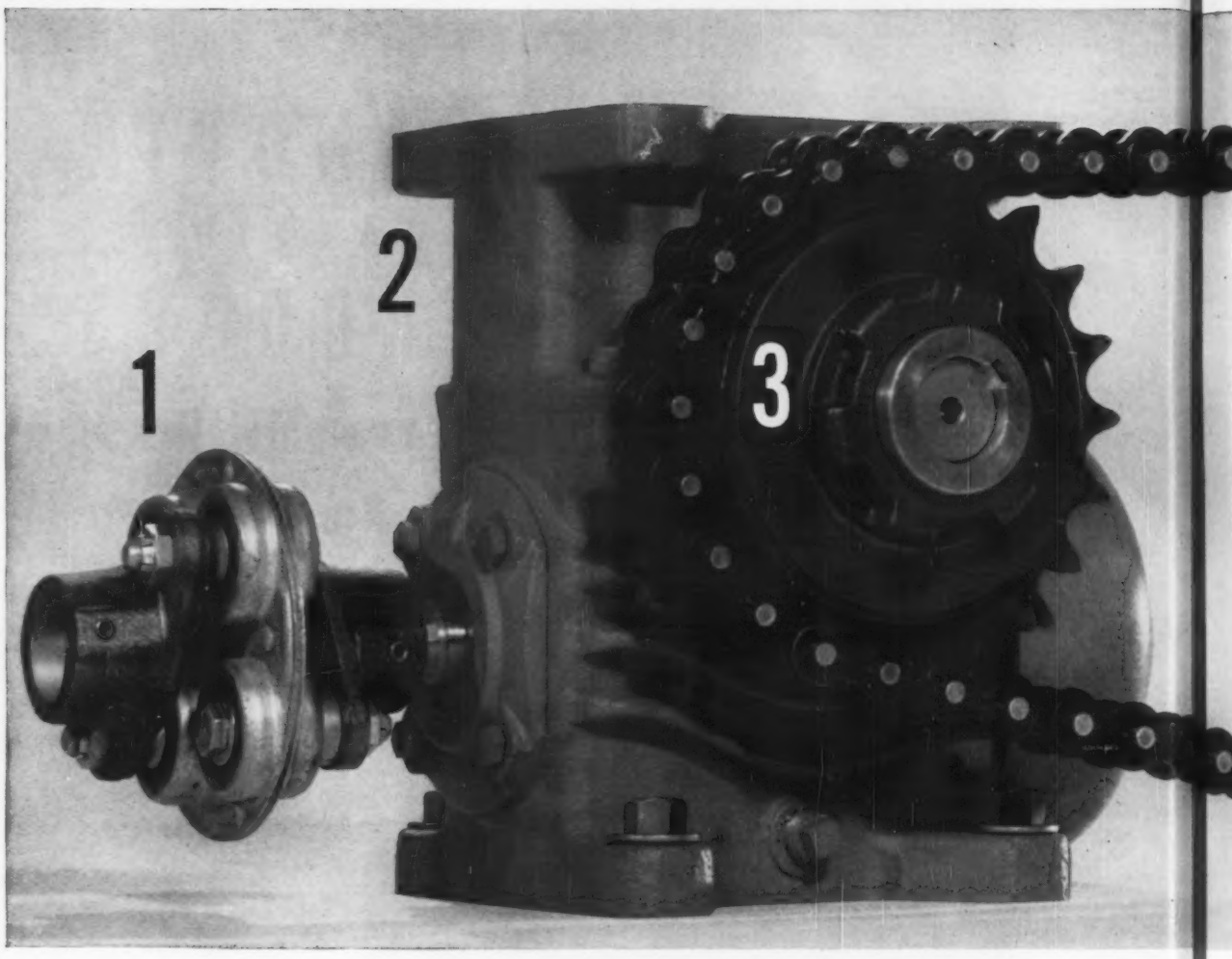
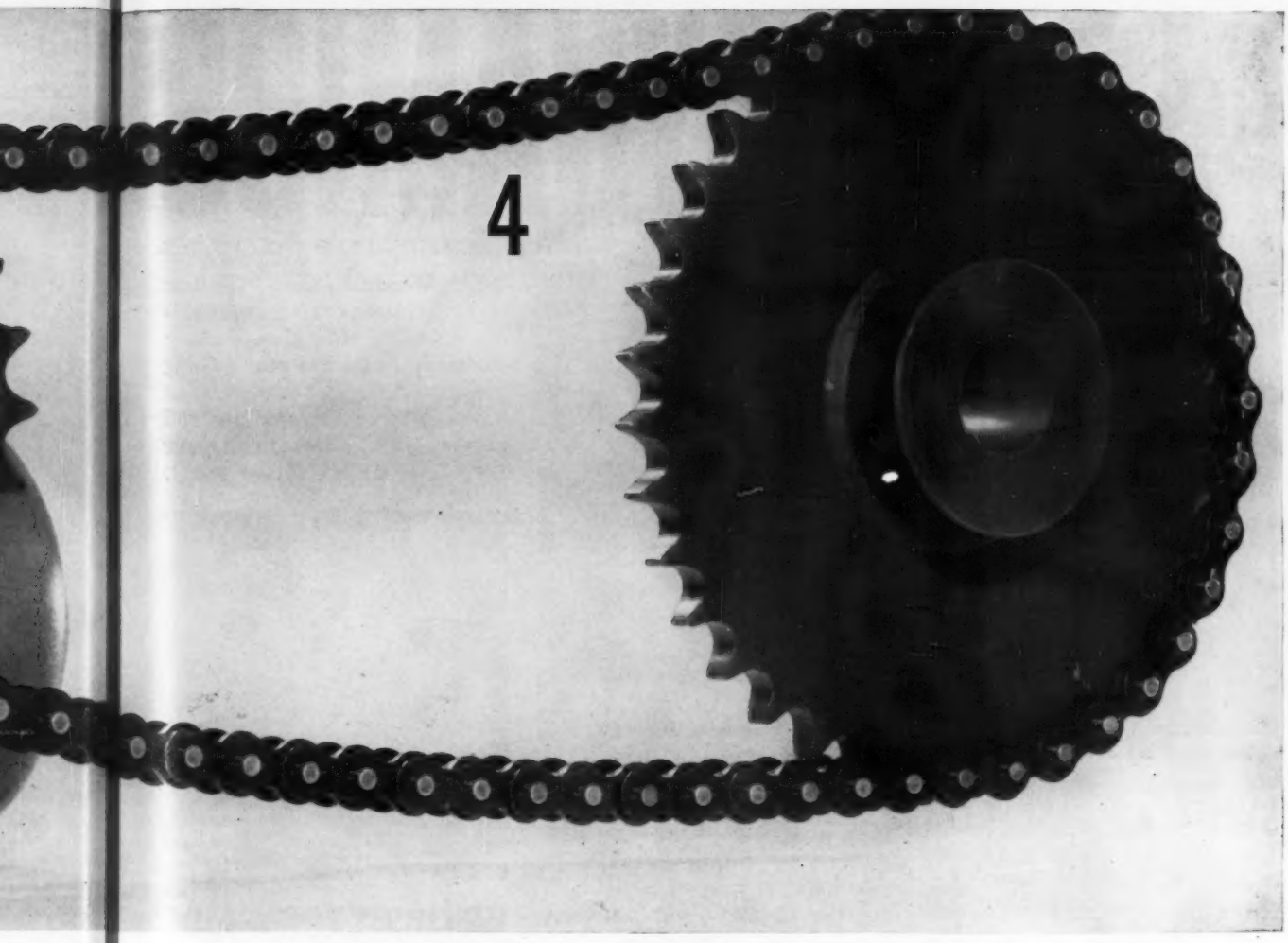
Works: Sandviken, Sweden



Morse's entry into the speed reducer field means:

Nobody can service your as completely as Morse, all four of these power

1 Couplings and Driveshafts	2 Eberhardt-Denver Speed Reducers	3 Clutches	4 Chain and "Timing" Belt Drives
Morflex	PoweRgear®	Torque Limiter	Roller Chain
Flexible Chain	Worm Gear	Cam	Silent Chain
Radial	Helical	Overcenter	Hy-Vo® Drives
Nylon	Gearmotors	Pullmore	"Timing"® Belt



power transmission needs because only Morse offers transmission components

REMEMBER: The toughest jobs in power transmission come to Morse, because *only Morse* offers one-source service on all four of these basic components . . . and backs them up with technical know-how based on over 60 years' experience solving power transmission problems.

MORSE

*Trademark

MORSE B-W BORG-WARNER

A BORG-WARNER INDUSTRY

Look for your local Morse distributor in the Yellow Pages under "Power Transmissions", or write:
MORSE CHAIN COMPANY, Dept. 33-89, ITHACA, NEW YORK. Export Sales: Borg-Warner International, Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ontario

Lincoln

WELDYNAMICS

NEWS ABOUT ARC WELDING AT WORK CUTTING COSTS

Sixteen 50-foot coach frames are assembled, welded and painted on this jig in one day.

SWITCHES ELECTRODE . . . SAVES $8,000

Guerdon Industries, Inc. of Newton, Kansas, builders of "Great Lakes" mobile homes, have doubled welding speed on undercarriages by a seemingly simple switch of electrodes.

Actually, the change was made as a result of a painstaking study by Ken Rymer, Guerdon's Welding Foreman; James Mandrut, Plant Superintendent and Bob Clemens, Lincoln's welding engineer in the area.

The frames consist of 13 gauge formed cross members welded in a jig to 12 gauge channels which form the longitudinal members. Length varies from 14 to 50 feet. Welds are made in vertical down and flat position and are of short duration thus requiring good restrike characteristics. The electrode also must combat light scale and oil.

Tests proved that Fleetweld 37, Lincoln's E-6013 electrode at 250 amps was twice as fast as the E-6010 rod previously used. Also cleaning time was greatly reduced because Fleetweld 37 has very little spatter.

At the present time, Guerdon's Newton plant turns out 16, fifty foot frames a day on one jig. Savings are averaging over $8,000 per year over the previous method.

Fleetweld 37 electrodes are ideal for short, high speed welds. Light rust and oil are no problem.

Mr. Mandrut states, "We look on Bob Clemens as our own welding engineer. He's always ready to tackle and solve our welding problems."

For help with procedures and cost reduction ideas, call your Lincoln welding engineer today.

Guerdon's Jim Mandrut, "Lincoln engineering service is outstanding."

WELDIRECTORY AIDS ELECTRODE SELECTION

Matching the electrode to the job for the most efficient welding is greatly simplified by the new Weldirectory of Mild Steel Electrodes.

Electrodes are grouped according to performance characteristics, and each electrode is discussed individually so that the user can determine exactly which electrode best suits his purpose.

A copy may be obtained by writing to The Lincoln Electric Co., and requesting Bulletin 7000.1.

THE LINCOLN ELECTRIC COMPANY

Dept. 1558 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

SCHLOEMANN

Faster, more accurate forging at lower cost

with the SCHLOEMANN automatic high speed forging control

Stroke adjustable (⅞ in. to 3½ in.) in ten to twelve stages by shifting the top dead center during the automatic reciprocating cycle. Number of strokes adjustable (20 to 100 per minute) in ten to twelve stages at established stroke through variable holding times at top dead center during automatic reciprocating cycle. Precision adjustment of work level at established stroke through shifting the top and bottom dead center during the automatic reciprocating cycle. Coarse adjustment of work level through an intermediate stroke with automatically interrupted reciprocating cycle. Low power water consumption by adjustability of the shortest reciprocating stroke required for planishing and by adapting the number of strokes to the precise amount of idle time required to move the forging, without changing the stroke.

FELLER ENGINEERING COMPANY 1190 Empire Building, Pittsburgh 22, Pa.

ROLLING MILLS FOR FERROUS AND NON-FERROUS METALS • COUNTERBLOW HAMMERS • HYDRAULIC PRESSES

Techline advances new concept of supplies services for precision finishing industry

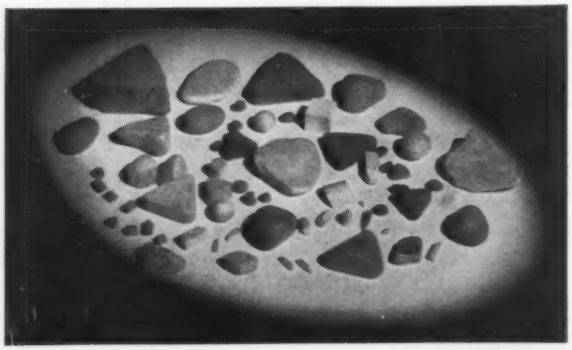
Only Techline offers you all your supplies for both the wet blast and barrel finishing processes from one convenient and dependable source.

Dependable—because Techline media, Chempounds and abrasives are manufactured expressly for precision barrel finishing and wet blasting. They are unsurpassed in their ability to speed production and cut finishing costs.

Convenient—because you can combine your purchases and cut costs through Techline's quantity prices, prepaid freight allowances, and rapid delivery.

For Barrel Finishing

Techline engineers have evolved new finishing techniques based on Wheelabrator Corporation's unequalled knowledge of cleaning and finishing processes, and utilizing the newest abrasive media and compounds. They are carefully selected for quality and uniformity and are formulated to achieve precisely the results you require.



For Wet Blasting

Techline Liquamatte equipment and supplies are well established as the most successful means of achieving precision finishes in wet blasting. Additives such as Anarust and Anaset, and newly-developed protective coatings for the finished work, assure you of optimum results in every application of Techline wet-blast equipment and Liquabrasives.

Techline shatters an industry's traditions — makes precision finishing a science.

New packaging developed for Techforms and Chempounds

For maximum convenience of handling and storage in your finishing department, Techline offers Techforms and Techangles in 100 lb. bags, and Chempounds in sturdy 50-lb. cartons as well as 400-lb. bulk containers. From a practical standpoint, carton packaging of Chempounds assures you of peak potency and freshness, since smaller quantities are exposed at a time. All Chempounds are compounded and packaged to order, to arrive in prime condition.

How you can use Techline's sample processing service

Techline is prepared to prove the savings you will realize through use of Techline barrel finishing or wet blasting equipment and supplies. Techline engineers will make a test demonstration in our modern laboratory, using actual samples of your production parts. You may send sample parts for analysis and testing without cost or obligation.

Write for Details of this Service

Your local Techline sales engineer will provide samples of Techline media and Chempounds to try in your own production. And he will arrange for a demonstration or sample test in our laboratory. Or, for detailed information and supplies prices immediately, write to Techline at Vicksburg, Michigan.

Techline
division of **WHEELABRATOR** CORPORATION

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they both weigh 74 pounds...

One is worth its weight in protection for the other as a rubber bumper on a "Dodgem" car in amusement parks.

From rubber or rubber-like parts as large as these to precision components weighing less than a gram—and for practically every condition you can think of . . . your nearby ORCO "Customeering"* man is familiar with them all.

So get the advantage of the experience that has put Ohio Rubber "Customeered"* components in outstanding original equipment in *every* industry. Write to The Ohio Rubber Company, Willoughby, Ohio. 9PA1

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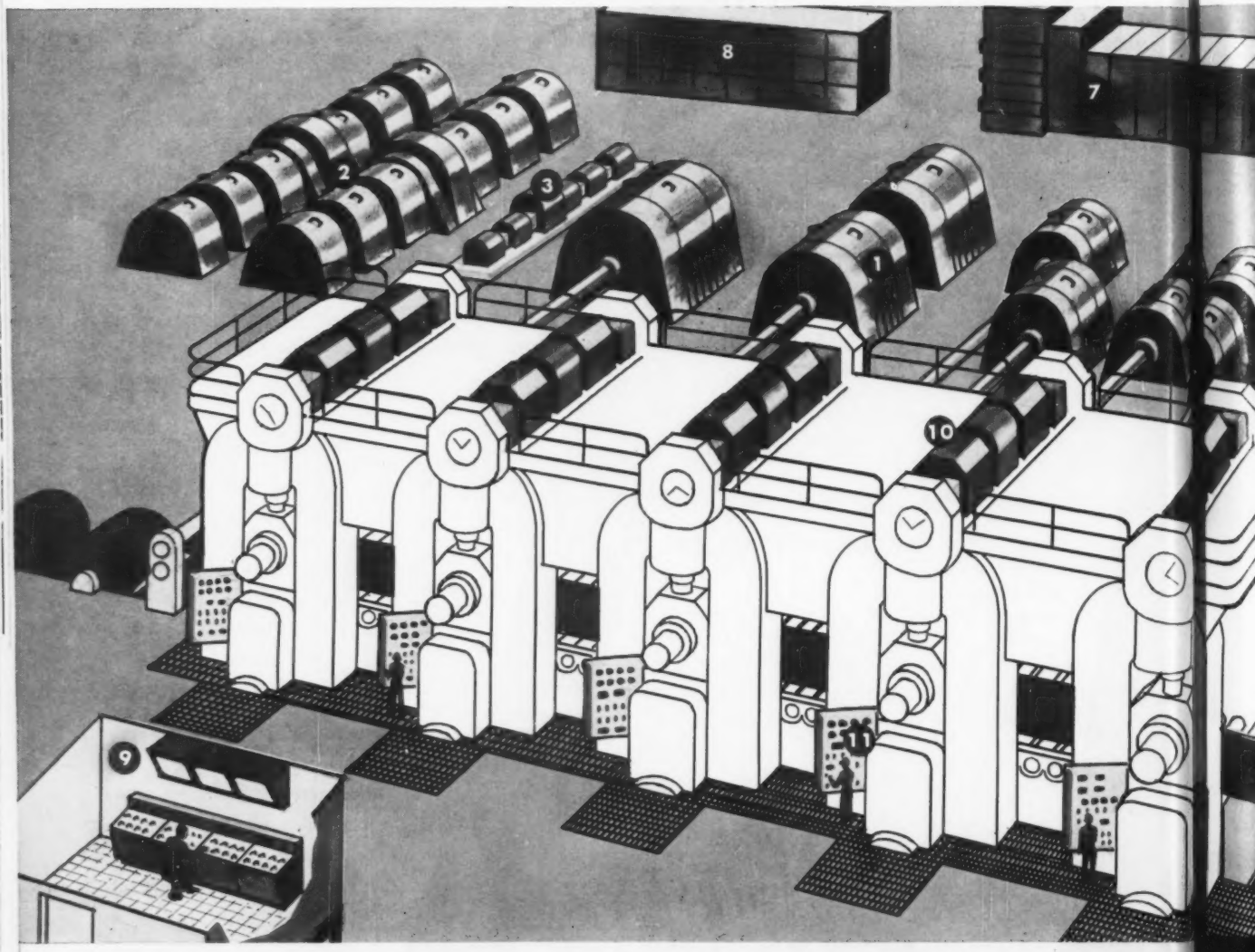
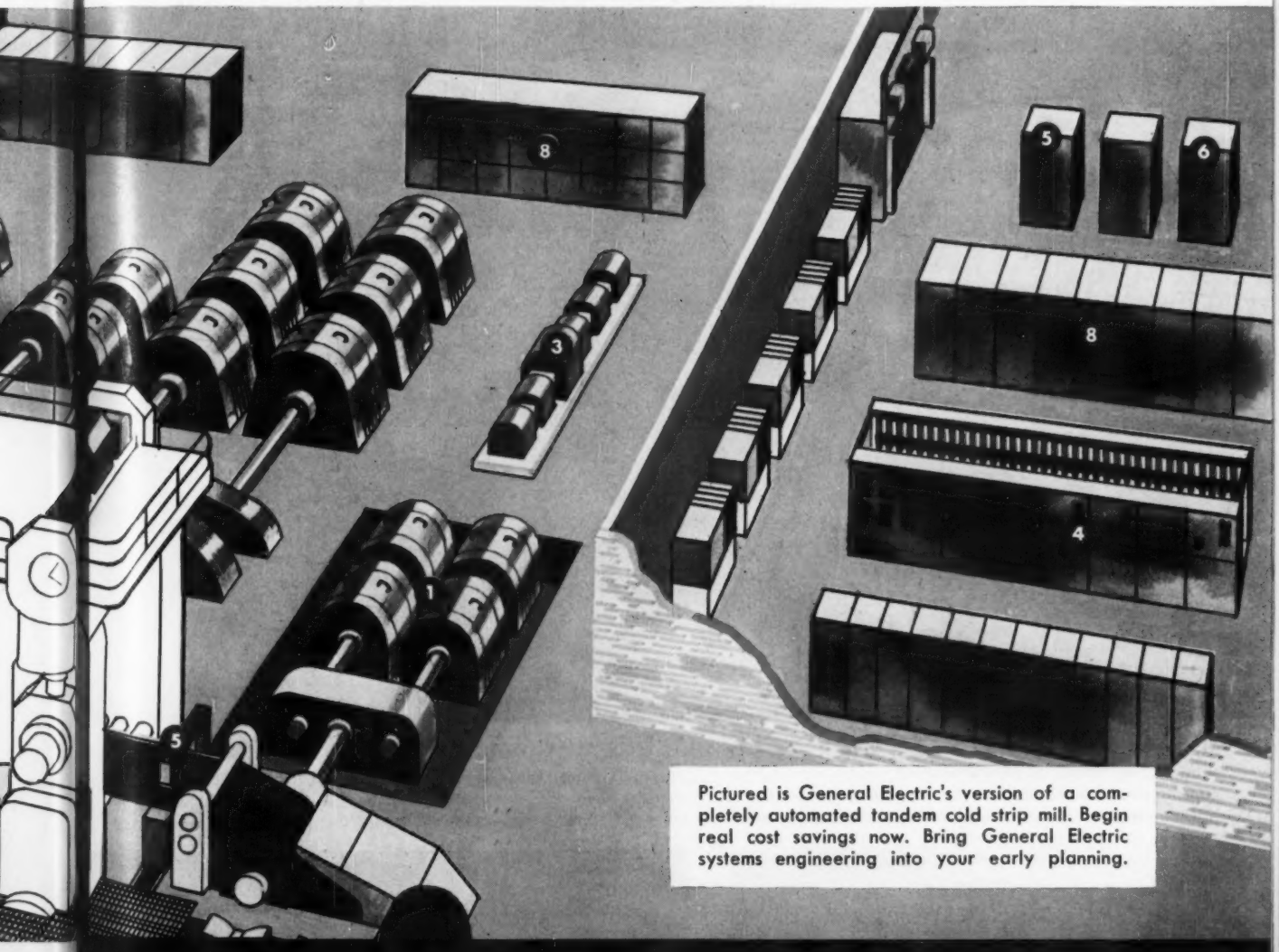
General Electric's new program for Automation through Modernization will help you . . .

INCREASE YIELD, MODERNIZE FOR PROFITS



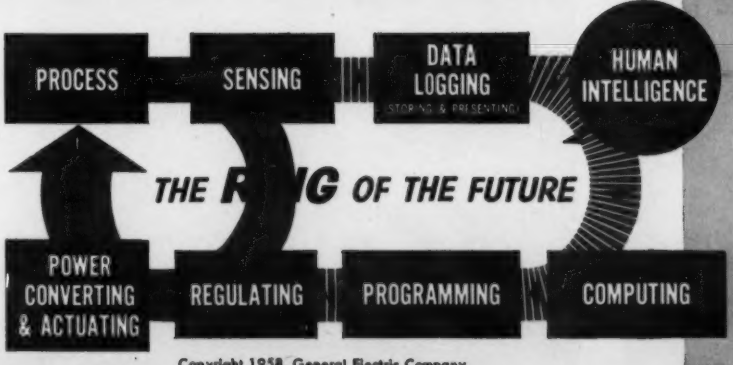
1. **Main drive motors** have low-inertia design for fast, precise response to high-speed schedules.
2. **Motor-generator sets** provide reliable d-c power to main drive motors.
3. **Auxiliary m-g sets** provide precise d-c power to screw down motors.
4. **Main mill control** utilizes most modern control techniques for maximum reliability while performing the complex functions of automation.
5. **Automatic gage control** using quick-response DIRECTO-MATIC static control and RAYMIKE 600 X-ray thickness gage combines extreme accuracy with great reliability over long periods.
6. **G-E 309 data logger** keeps accurate record of gage. Records all production information important to business functions of the mill.
7. **Load center** assures reliable secondary distribution of d-c power, at the desired voltage level, to all points-of-use in mill.
8. **Metal-clad switchgear** combines maximum reliability and safety with minimum of maintenance in distribution of power to all mill functions.
9. **Control console** with closed-circuit TV gives one operator control of all high-speed rolling operations and visual contact with all remote and inaccessible mill functions.
10. **MD-600 motors** drive stand screwdowns, provide instant response and minimum of maintenance to most vital mill function.
11. **Individual stand control** allows presetting of stand speed relationships and mill openings during threading operation.

You can completely automate your tandem cold mill now . . . through a logical, step-by-step program of modernization. General Electric engineers, with more than 25 years experience in development and application of electrical systems for tandem cold mills, will blend available, advanced equipment and the latest technology into a coordinated system for you. This will assure you uniform thickness, low-cost efficient operation, maximum mill utilization plus increased yield. Begin planning for low-cost automation through modernization now. Call your nearest General Electric Apparatus Sales Office today.



Pictured is General Electric's version of a completely automated tandem cold strip mill. Begin real cost savings now. Bring General Electric systems engineering into your early planning.

THE "RING OF THE FUTURE" KIT IS GENERAL ELECTRIC'S GUIDE TO AUTOMATION THROUGH MODERNIZATION. ***Write for your kit today.***



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TO: SECTION 804-4
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK

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Name_____

Position_____ Company_____

Address_____

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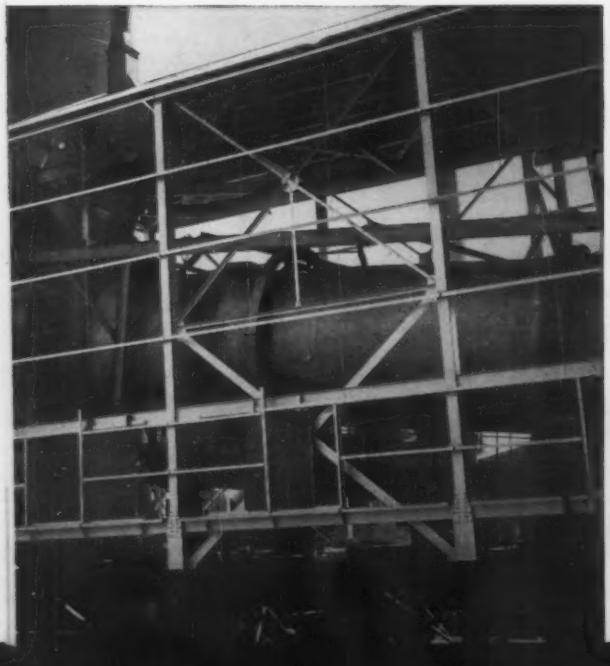
Automation Through Modernization

GENERAL ELECTRIC

GREAT LAKES S

This balling drum is the biggest ever used—50 feet long and 12 feet in diameter. It has an adjustable-speed motor and the slope is controlled by shims. This superior method of preparation is delivering 600 tons of permeable sinter mix material per hour.



The straight-line, forced-draft cooler is 10 feet wide and 178½ feet long over the windboxes. It is cooling hot sinter at the rate of 480 tons per hour. A 50-hp motor drives the cooler strand at about 11 feet per minute.

Ope
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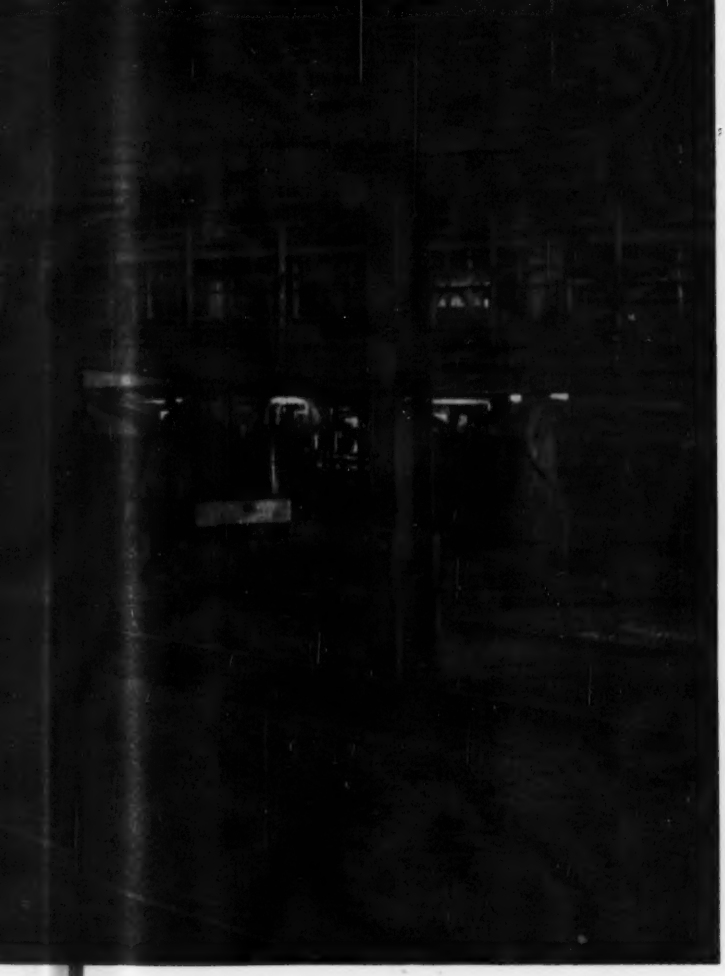
ES STEEL SETS INDUSTRY RECORD



long
s per
nute.

Operation of the sintering plant and materials handling systems is controlled from this panel board, located at the feed end of the sintering machine. It's the largest iron ore sintering machine in the world.

8,400 tons of sinter per day in new plant built by KOPPERS

It's the largest iron ore sintering machine in the world —12 feet wide and 200 feet long over 19 double windboxes. It's a giant, but operates with a very high efficiency. Total output of 8,400 tons from *one* machine in a single day is a new record for sintering.

This plant is part of the continuing expansion program at the Zug Island Works of Great Lakes Steel, a Division of National Steel Corporation. The company foresees a hot metal production increase of 20 to 30%, due largely to the sintering and ore handling facilities designed and built by Koppers Company, in cooperation with engineering and operating personnel from National Steel.

The new facilities include an ore handling system, an ore crushing and screening station, a miscellaneous materials handling system, a sintering plant, and a sinter handling system. The installation has 84 conveyors, with widths up to 48 inches and capacities to 1,250 tons per hour.

Many of the features in this installation are entirely new to commercial plant operation. You might be interested in the complete story, which is covered in an 18-page booklet, "Ore Handling and Beneficiation at Great Lakes Steel." For a free copy, please write to Koppers Company, Inc., Engineering and Construction Division, Room 1124, Pittsburgh 19, Pa.

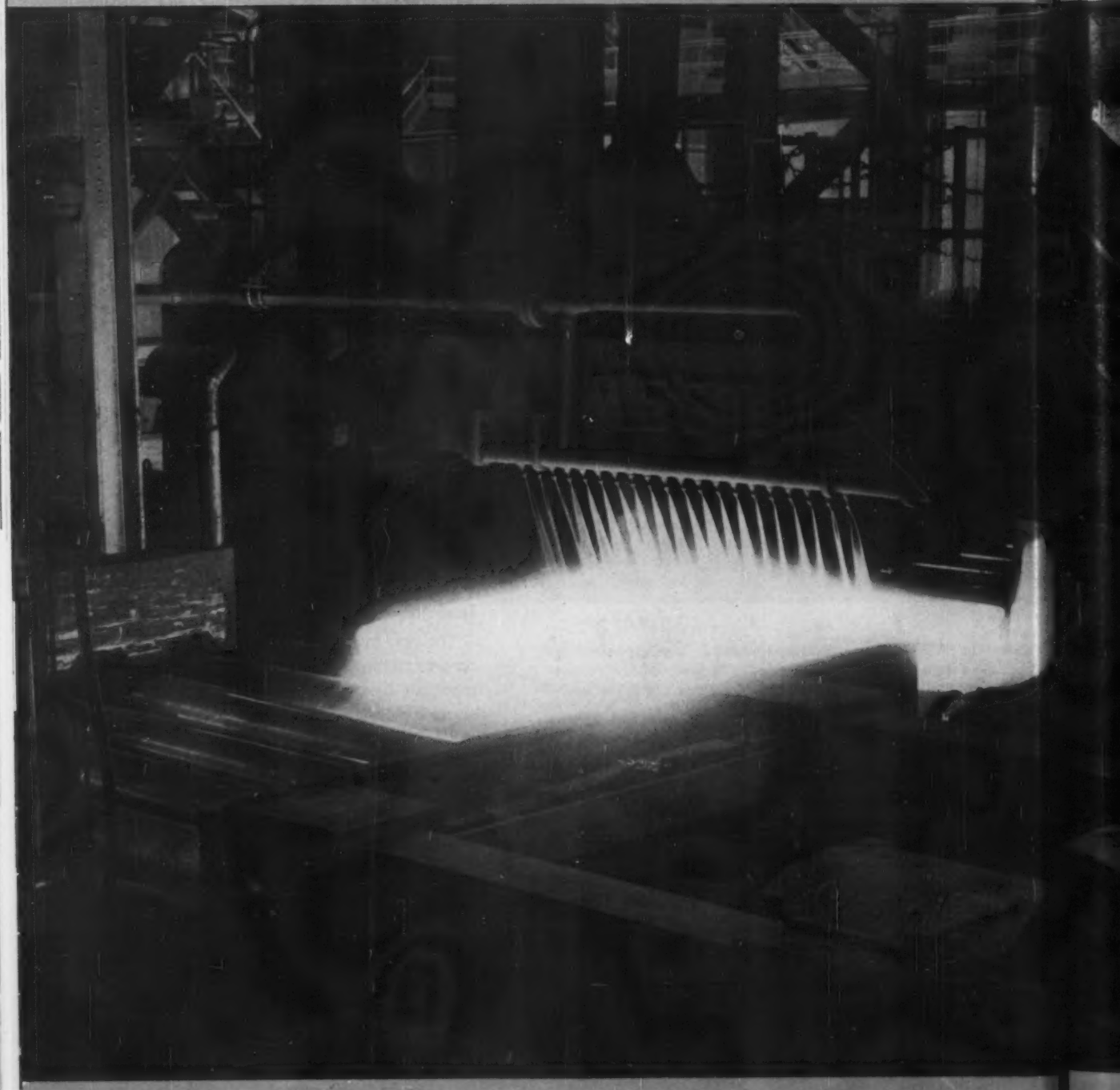
KOPPERS

KOPPERS

ENGINEERING AND CONSTRUCTION

DE LAVAL
CENTRIFUGAL PUMPS

for high-pressure d

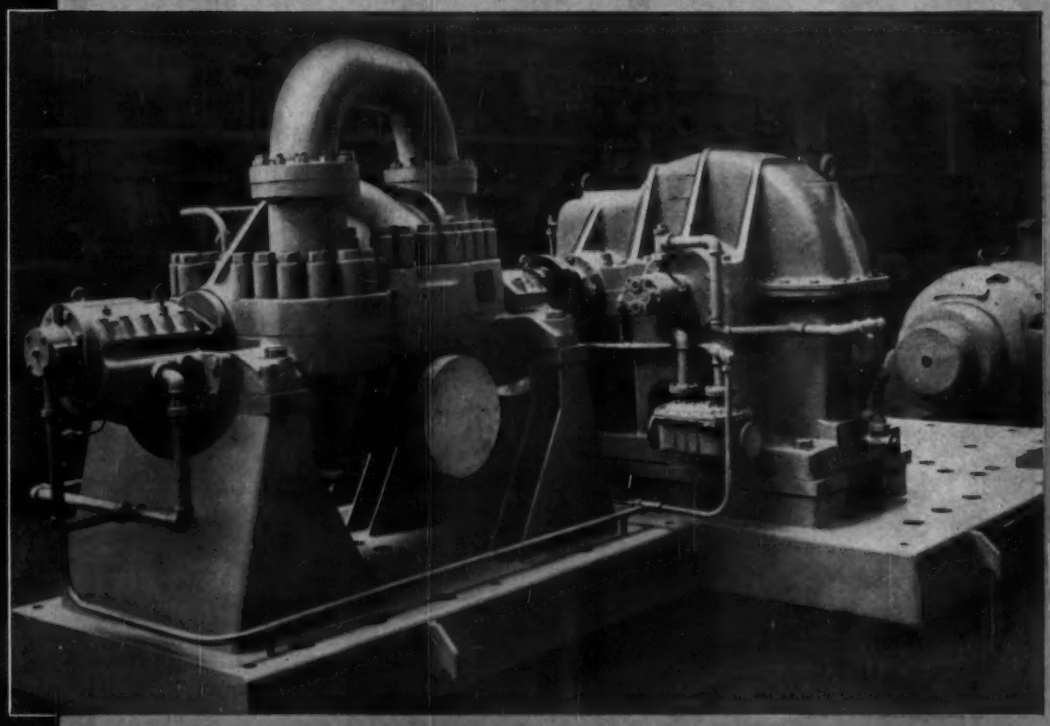


re descaling at Lukens Steel

Latest successful technique of high-pressure descaling is now being performed in this modern steelmaking facility designed by Mesta Machine Co.

The initial high-pressure descaling operation uses De Laval split-case multi-stage pumps as shown in the photograph below. Each pump supplies cold water at 1000 gpm and 1600 psig. Electric motors rated at 1750 hp drive the pumps through speed increasers which raise the speed from 1200 rpm to 4250 rpm.

De Laval pumps also serve Lukens on a 1200 psig descaling system in another section of the Coatesville, Pa. mill.

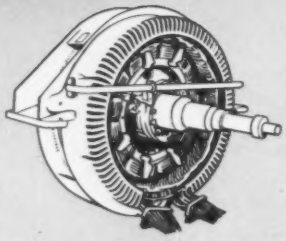


One of several arrangements available for descaling service at pressures of 1000-1200-1600 psig and capacities to 2200 gpm.

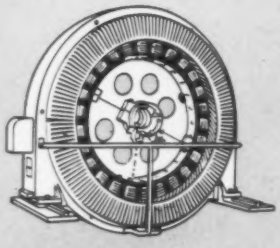
DE LAVAL *Steam Turbine Company*

899 NOTTINGHAM WAY, TRENTON 2, NEW JERSEY

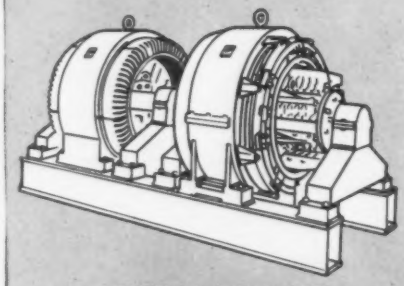
MATCHED-TO-THE-JOB PERFORMANCE
assured by
EP SPECIALIZATION



SYNCHRONOUS GENERATORS
125-5000 KVA
ASK FOR BULLETIN 43-205



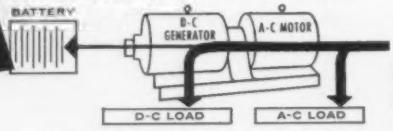
SYNCHRONOUS MOTORS
20-5000 HP
ASK FOR BULLETIN 43-205



MOTOR-GENERATORS
¾-1500 KW
ASK FOR BULLETIN 30-200

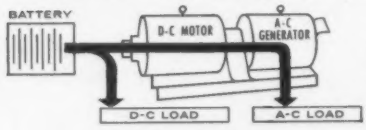
also
ELECTROLYTIC POWER SUPPLIES
FREQUENCY CHANGERS
INDUCTION MOTORS
D-C MOTORS & GENERATORS
ADJUSTABLE-SPEED DRIVES

THIS (Normal Operation)

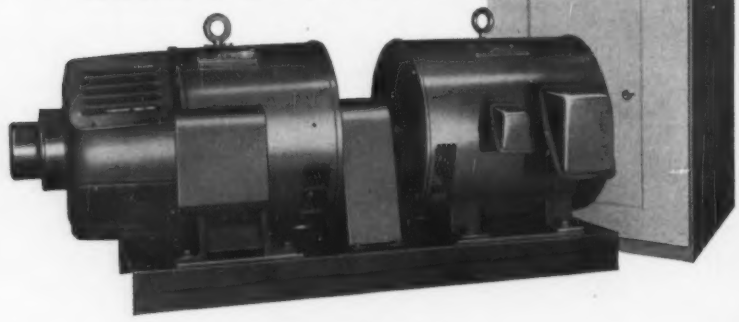


A-C POWER SUPPLY

BECOMES THIS (Emergency Operation)



~~A-C POWER SUPPLY~~



Inverter-Diverter
THE ONLY CONTINUOUS A-C and D-C POWER SYSTEM

This standby Power System changes from normal operation to emergency operation (when the normal a-c power supply is interrupted for any reason) without any appreciable change of voltage or frequency of the load current. The changeover is instantaneous. It is ideally suited for any application where *UNINTERRUPTED* electrical service for either or both a-c and d-c loads is required.

Only *one* motor-generator set is used as a combined battery charger, d-c power supply and a-c standby power. Note, from the diagrams above, how the D-C Generator and A-C Motor "invert" for emergency operation. And the D-C Generator is the well-known Electric Products DIVERTER-POLE with its unequalled battery-charging characteristics.

The Inverter-Diverter requires less space, reduces installation time and expense, cuts maintenance costs and provides absolute dependability. For complete details:

ASK FOR BULLETIN 21-200

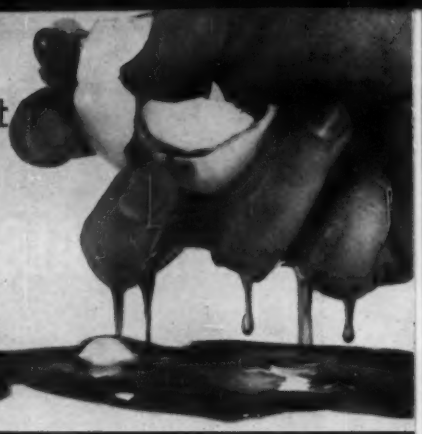
EP ENGINEERS A TYPE OF CONTINUOUS A-C AND D-C POWER SYSTEM TO MEET THE SPECIFIC APPLICATION REQUIREMENTS

ELECTRIC PRODUCTS COMPANY

1725 CLARKSTONE ROAD CLEVELAND 12, OHIO

EP

End that "ROTTEN EGG" odor in your plant

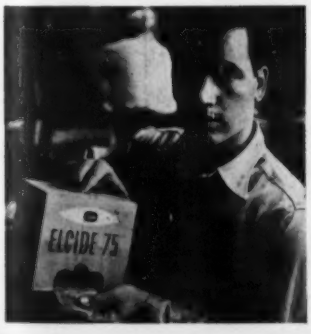


Odor's bad enough. But even worse, it costs you money! For "rotten egg" odor is the sure sign of a rancid coolant. How do you prevent spoilage and cut costs? Elcide 75 does it more effectively than any other bactericide on the market! HERE'S HOW:

These bacteria are called Pseudomonads. They're present in all soluble oil emulsions. During the heat of summer, they multiply and set the stage for a secondary contamination by . . .

Sulfate-reducing bacteria. They follow Pseudomonads and feed on the emulsifying agent in soluble oils. As they multiply, they give off hydrogen sulfide gas which smells like rotten eggs.

This contamination eventually causes a separation of the oil-water mixture and leads to corrosive slime and sludge that clogs screens, filters and may damage machines, tools and products.



One ounce of new Elcide 75 in each four gallons of fresh emulsion eliminates these bacterial problems *completely!* Controlling a wider range of bacteria than other inhibitors, Elcide 75 really *stops* bacteria build-up and lengthens the life of emulsion by as much as 5½ times!

Here are two samples of the same used emulsion. The one at left was not treated. Notice the heavy growth of bacterial colonies. The emulsion at right was treated with Elcide 75. It's clean and fresh.

55-gallon stainless steel. $6.50 per gal.

5-gallon polyethylene. $8.00 per gal.

1-gallon polyethylene (4 per case). $8.50 per gal.

ELCIDE 75: THE MOST EFFECTIVE BACTERICIDE because it (1) controls a wider range of bacteria, (2) is more effective (through double action) and (3) gives coolants longer life than other bactericides on the market. Elcide 75 prevents odors, checks sludge, protects machines, cuts downtime, saves coolant, reduces disposal problems.

Prove the value of Elcide 75 with your own cost analysis. For more information, or to place your order, write today.

ELCIDE 75™

PATENT PENDING

KEEPS COOLANTS FRESH AS A DAISY!

Lilly's brand of bacterial inhibitor for cutting fluids

ELI LILLY AND COMPANY • AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION • INDIANAPOLIS 6, INDIANA • TELEPHONE: MELROSE 6-2211

MATERIALS & FABRICATION PREVIEW

of the SOARING 60's

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International Amphitheatre

Project yourself into the future — prepare for the challenge of progress in metals by attending this great materials and fabrication preview of the soaring 60's. Never before so complete a show of equipment, technical sessions and interpretive exhibits. Don't miss it! Make plans for Chicago NOW!

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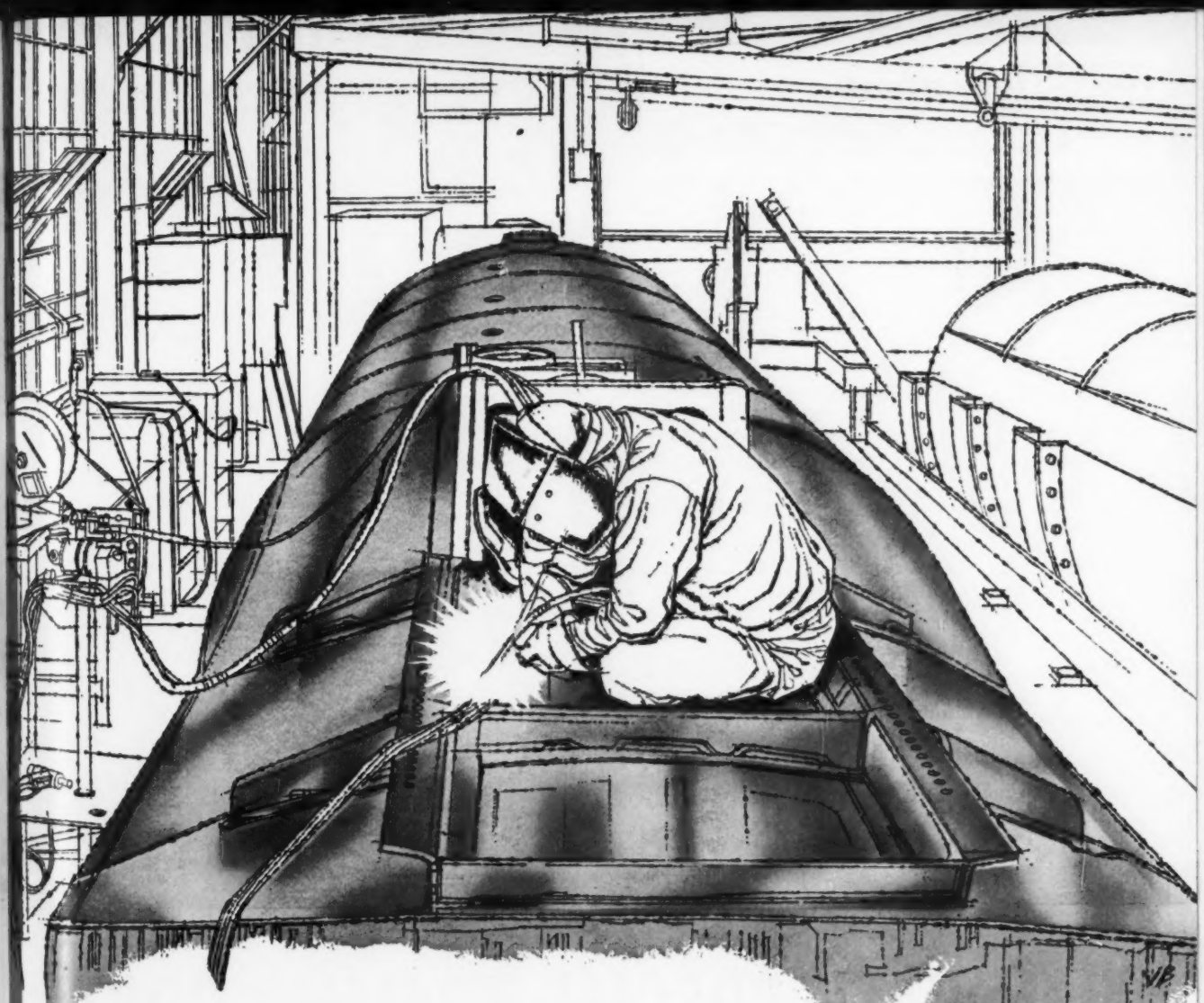
Special Libraries Association—Metals Division; American Society for Testing Materials—Committee B-9; and the extensive programs of the American Society for Metals with the William Park Woodside Memorial Sessions, and ASM Metallurgical Seminars.



Formula for Success

The formulation of a stainless steel alloy requires as much precision as any chemical compound. All the care exercised in the selection of a particular alloy can be nullified by variations in the analysis specified.

During fabrication, for example, slight differences in chromium-nickel: carbon ratios can cause changes in microstructure which lead to early failure.

That's why it is safer to specify J&L Consistent Quality Stainless Steel. J&L leads the industry in melt shop standards for stainless steel—the point where quality starts, **and longer service life begins.**

Plants and Service Centers:
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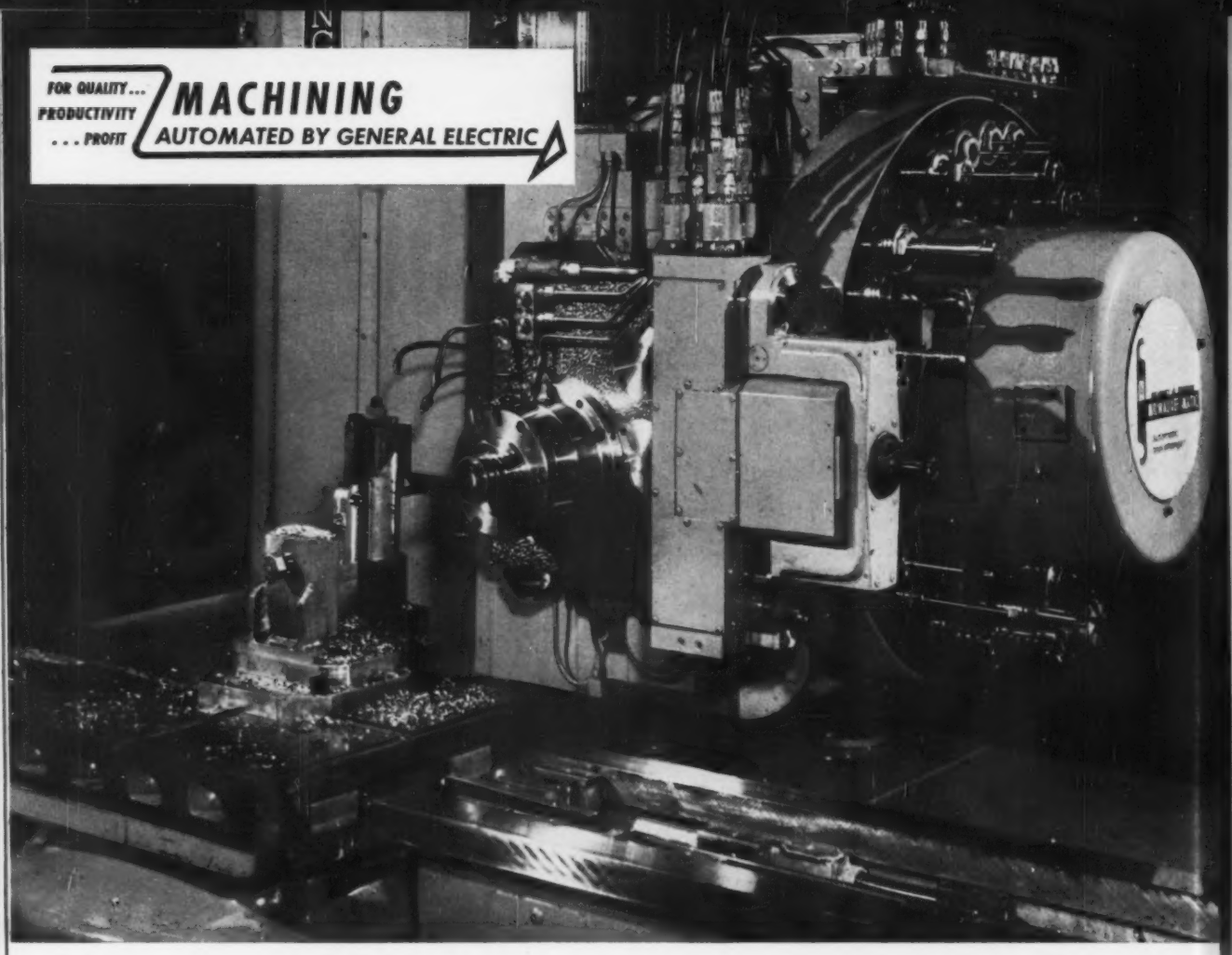
STAINLESS
SHEET • STRIP • BAR • WIRE

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34

FOR QUALITY... PRODUCTIVITY ... PROFIT

MACHINING AUTOMATED BY GENERAL ELECTRIC



ELIMINATE SPECIAL TOOLING COST

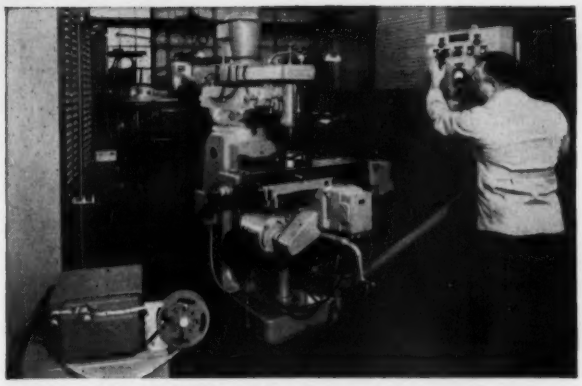
MARK SERIES NUMERICAL CONTROLS...

.....standard, job-proved packages now in use on a wide variety of machines

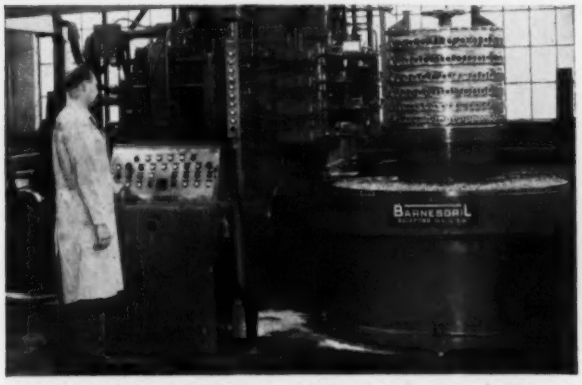
General Electric's Mark series of standard, pre-engineered numerical control packages—with systems for controlling 1 to 5 motions plus machine auxiliary functions—are compiling impressive performance records on scores of machines throughout American industry today.

Machine operation is completely automatic—from punched tape prepared on a standard automatic typewriter. If desired, semi-automatic positioning, useful for prototype work, is obtained with manually set dials on the control station.

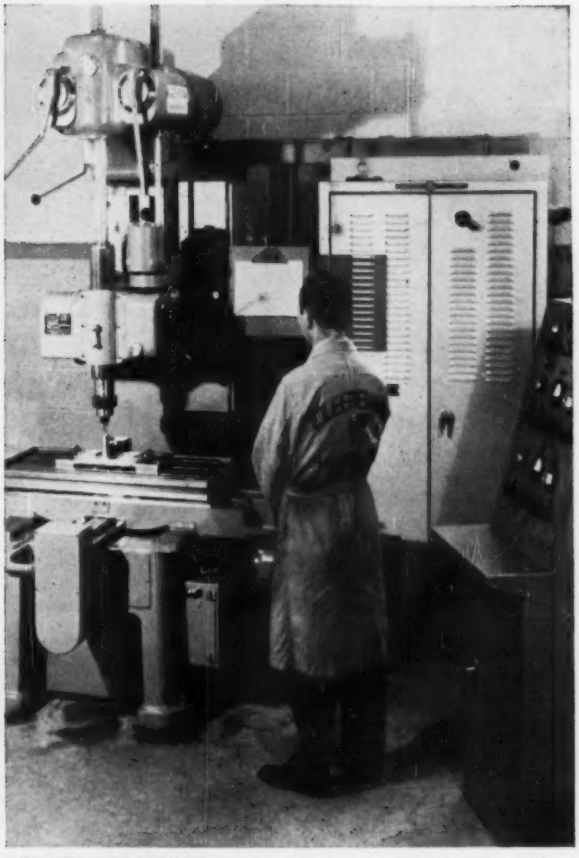
Key components of a typical Mark package are a controller, a punched tape reader, operator's control station, servo drives and position-sensing units.



60-80% LESS FIXTURE COST is average for all new parts produced on this general-purpose milling machine. Tooling expense saving for one part totaled $2000.



TOOLING EXPENSE CUT from $5000 to less than $100; 248 critical holes spotfaced, drilled, bored, counter bored, and chamfered with no jigs or templates.



NO JIGS ARE NEEDED on this G-E controlled layout drilling machine. Tooling cost on one part was reduced from $1350 to $20; $1000 worth of fixtures eliminated on another job.

with General Electric numerical control

Eliminate jigs, cut lead times, save costly tool storage space

A key benefit of General Electric numerically controlled machines is the elimination of special tooling cost in application after application. Reports show jigs, templates, and complex fixtures are absolutely unnecessary—being replaced even in the most intricate jobs by simple holding clamps.

What does this mean to you? It's the end of costly tooling . . . it's shorter lead-time cycles . . . less investment in tool storage and maintenance . . . more flexibility in production scheduling.

Many manufacturers find that savings on tooling costs *alone* will pay for their G-E numerically controlled machines. As an example, on a group of six parts, with a variety of operations performed by a multi-purpose tape controlled machine, tooling savings totaled over $10,000 with cost reductions on a single part from $1890 to $260. With less than 100 such parts, the machine is paid for.

In a routine drilling job, $1300 worth of jigs were replaced with a simple $20 holding clamp.

And, another Mark II controlled drill press more than paid for itself in a few weeks. More than 120 different drill jigs—which would have cost $186,000—were *not* made. These savings alone totaled more than 6 times the original investment in the numerically controlled machine!

Join with the more than a hundred manufacturers who are increasing worker productivity, gaining better product quality, and eliminating special tooling cost with G-E numerically controlled machines. See your G-E Apparatus Sales Engineer or machinery builder today. General Electric Co., Specialty Control Dept., Waynesboro, Va. 795-6

Progress Is Our Most Important Product

GENERAL ELECTRIC

"Research and development at National keep pace with expansion,"

reports Joe Marsalka, Metallurgist

"Expansion of plant and equipment are only part of the progress story at National Roll & Foundry Division. Our research and development program has made corresponding progress and, in addition, National and its roll customers benefit greatly through the research and development staff of the parent company, General Steel Castings.

"This expanded program has resulted in important developments which have increased the fine quality and dependability of National rolls. For example, in the steel foundry, a new quenching machine, developed by National, provides greater control in air or water quenching of alloy steel rolls.

"In the iron foundry, a new pressure ladle not only simplifies the production of nodular iron, but permits closer control of its physical properties.

"We are continually testing new ideas and new methods with one thought in mind . . . to give you the best in iron and steel rolls."

GENERAL STEEL CASTINGS

National Roll & Foundry Division

Avonmore (Westmoreland County) Pennsylvania

General Steel Castings Corporation: General Offices, Granite City, Ill.

Plants: Granite City, Ill.—Eddystone, Pa.—Avonmore, Pa.

puts that "want-to-buy" gleam in their eye

UNILOY
STAINLESS STEELS

The gleam in *her* eye reflects the brilliant beauty of stainless steel trim. The gleam in *his* eye reflects the protection that only stainless steel provides. Helps keep that "showroom look" for years.

Specify Uniloy stainless steel, produced by steelmakers who have been making specialty steels since 1884. This backlog of experience explains Uniloy's gleaming finish, why it is so easy to fabricate. For prompt delivery of Uniloy stainless steel rolled to your exact specifications, write or call our nearest sales office or warehouse.

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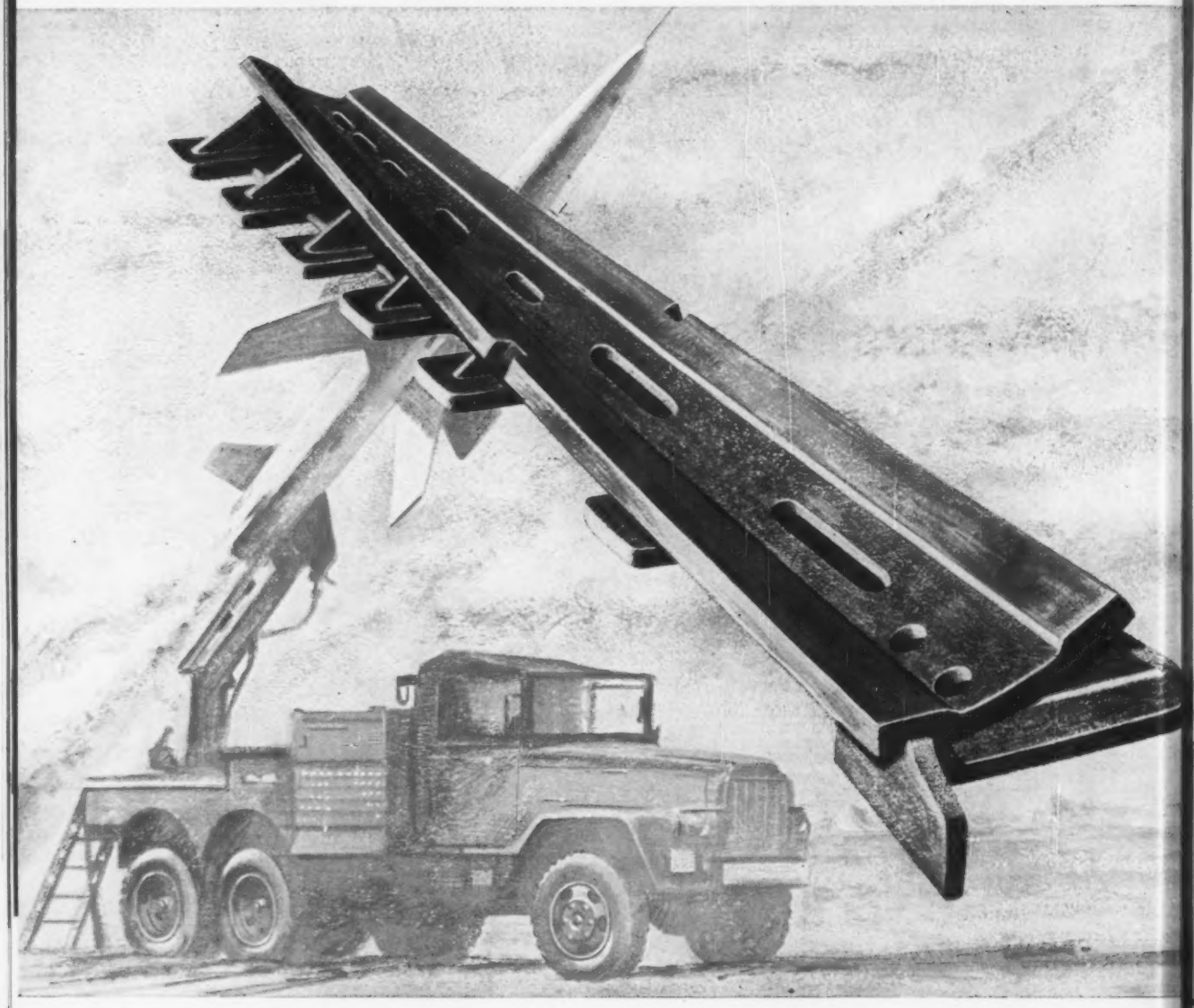
STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

How the Foundry Industry serves America . . . #1 of a Series



IRON CASTING REDUCES COST OF MISSILE LAUNCHER TRACK BY 41%

This important contribution to the guided missile industry was accomplished by replacing the nine independent parts formerly used with one integral high-strength iron casting. Not only was a substantial saving effected, but the cast iron track with its much greater dimensional stability assured the exact alignment so vital to successful missile launching.

This is a typical example of the improved performance at lower cost that can be achieved by incorporating modern iron castings into sound, modern industrial design.

Hanna is proud to be part of this great industry and will continue to provide foundries with all regular grades of pig iron . . . foundry, malleable, Bessemer, intermediate low phosphorus, as well as HANNATITE® and Hanna Silvery . . . in the same high quality and to the same high standards that have made Hanna the best known name in iron.

Facts from files of Gray Iron Founders Society

HANNA THE BEST KNOWN NAME IN IRON

THE HANNA FURNACE CORPORATION

Buffalo • Detroit • New York • Philadelphia

Merchant Pig Iron Division of

NATIONAL STEEL CORPORATION

4 Types of Multi-Unit Automatics for High Production to Close Tolerances

Each of these four machines on our assembly floor is a different type. Each one is the most efficient setup for its particular job.

But these different types of machines are alike in these ways —

- **Operations.** Drill, counterbore, ream, tap, mill (light cuts), etc.
- **High production.** A number of automatic units of ½ to 5 hp each perform different operations at the same time.
- **Close tolerances. Few rejects. Little downtime.** Each machine has good basic design and rugged accurate construction.
- **Ready to produce.** Samples run for approval before shipping machine.

For a specific proposal ask our representative in your area. Or write us. Kingsbury Machine Tool Corp., Keene, New Hampshire.

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Michigan	Detroit 19 Grand Rapids 4	Birmingham & Conner Joseph Monahan
Missouri	St. Louis 24	R R Stephens Mchy Co
New York	Long Island City Syracuse 1	Triplex Mach Tool Co Syracuse Supply Co
Ohio	Cincinnati 2 Cleveland 3 Dayton 2	E A Kinsey Co Golden & McCoy Co C H Gosiger Mchy Co
Pennsylvania	Philadelphia 6 Pittsburgh 37	John S Wright, Mchy Merit Machinery Inc
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REGULAR INDEXING

For most high production work. Perform successive operations from one direction or several. Index units in four sizes: 12-, 20-, 26- or 40-inch. Four to 10 stations (12 with 40-inch).

CENTER COLUMN INDEXING

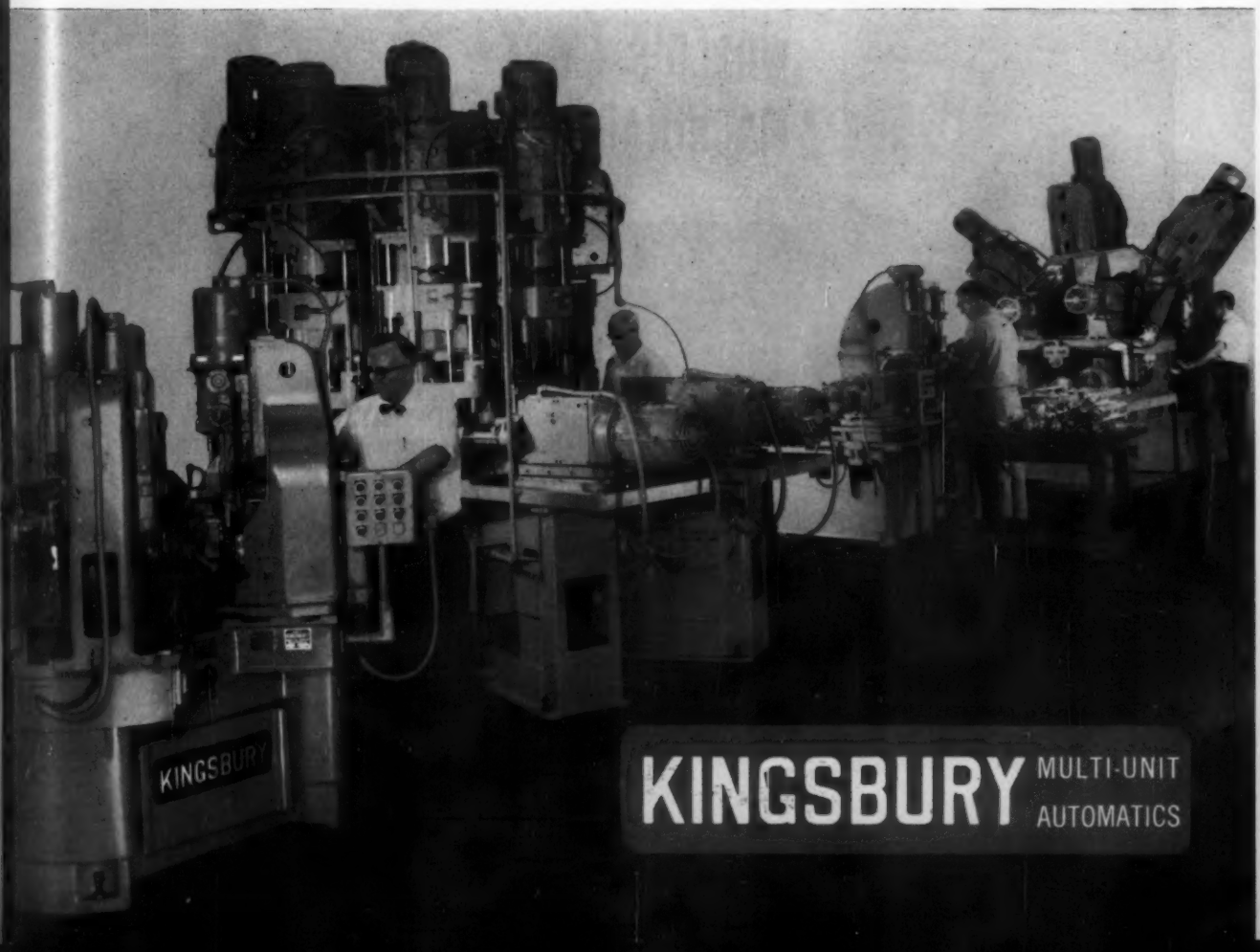
For more operations or larger parts than the regular indexing machines can handle. 8 to 14 stations. 43- or 63- inch index table. Horizontal units mounted on knees. Easy access to tools.

NON-INDEX (WAY TYPE)

For operations from 2 or more directions on one part at the same time. When a job needs successive operations, two or more of these machines may make the most efficient setup.

VERTICAL INDEXING

For successive operations from opposed directions with up to 5 horizontal units on each side of the machine. Up to 4 radial units provide a third direction. 8 stations in a vertical plane.



Unless you buy leaded steels directly from Inland's Indiana Harbor Works, chances are you've never seen this tag. But among Cold Drawers and Steel Warehouse men who process and sell leaded steels in a variety of forms to manufacturers, it is famous.

Every one of them recognize that behind this tag lies years of research, development and *unequaled experience*. Twenty years ago it marked the world's first commercial leaded steel. Today this tag represents the standard of performance by which all other free-machining steels are compared. It signifies LEDLOY* . . . the most machinable leaded steels obtainable.

INLAND STEEL CO., 30 West Monroe Street, Chicago 3, Illinois.

Get Inland Ledloy *steels in cold drawn form, sometimes sold under different trade names, from leading cold drawers and Steel Service Centers from coast to coast.*

*Reg. Trade Mark

This is INLAND LEDLOY®

WORLD'S MOST MACHINABLE STEEL

INLAND STEEL COMPANY

IN SPITE OF GLOWING REPORTS of still-high steel inventories, there are many signs of a supply crisis approaching. These include: Spot shortages of many products, shortages among small users, premium prices charged by some distributors, the return of the steel broker, and foreign steel prices rising as high as $5 per ton over mill prices.

IN GAGING STEEL STOCKS AGAINST the probable length of the strike, many users underestimate the time it will take mills to get back into full operations. If the strike lasts eight weeks, it will require another four weeks before most consumers see more than a trickle of steel shipments.

SPENDING FOR NATIONAL DEFENSE is not likely to rise much in the years just ahead. Defense budget planners are holding a close rein on high-cost projects. Intercontinental missiles, for example, will not be ordered on a crash basis. Barring a new barrage of cold-war tensions, $5 billion a year increases in defense spending, the rule in the period of 1955-1959, are over.

A BIG GAIN IN CONTRACTS FOR INDUSTRY building is the most significant factor in first half construction. Contracts in the first half of 1959 set a new record for the period, according to F. W. Dodge Corp. The construction specialists call the factory construction recovery "phenominal." Total contracts for the half year reached $18.9 billion, 12 pct ahead of last year.

YOU CAN COUNT ON AUTO COMPANIES pushing through their changeovers to 1960 models in near-record time. Ford, for example, will close down its lines for only two to three weeks after production of 1959 models ends late this month. All facilities are expected to reopen before mid-September.

EFFECTS OF THE STEEL STRIKE on overall business are reflected in economic indicators for July. The FRB Index of Industrial Production dropped two points to 153 on the basis of strike effects. Personal income rose only $300 million in the month. Recalling that July covered only two weeks of the strike, effects are expected to be compounded as the shutdown continues.

BUSINESSMEN STILL LOOK FOR BETTER SALES in the fourth quarter than a year ago. Dun & Bradstreet's fourth quarter survey of businessmen's expectations shows that three-fourths of executives look for higher sales. This is in line with record optimism reflected in second and third quarter surveys. Manufacturers of durable goods were the most optimistic group.

After 30 years' service these 8 Cleveland speed reducers needed no new parts!

Here are eight Cleveland Worm Gear Speed Reducers that have been on the job in this wire drawing plant continuously since 1929. Recently they were dismantled — then reassembled without *any* replacement of parts. Good for many more years of rugged service.

This is typical of the type service you can expect when Clevelands handle the right angle transmission of power in your plant. They save space and make for easy installation.

Before you buy machines or mechanize existing equipment, check and see what Clevelands can do to improve your operation. The complete story is contained in Bulletin #145. Write for your free copy, today.

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Steel Users Were Well Prepared But Strike Starts to Hurt

Signs of a coming serious supply pinch are increasing as strike enters sixth week.

Within two more weeks, inventories will dip below normal. In four more, a lack of steel could slow down manufacturing.

▪ Steel users are riding high on inventories built up for the best planned steel strike in history.

But with the shutdown entering its sixth week, the supply pinch is starting to hurt. Within two more weeks most steel users will have less than normal inventories. After four more strike weeks, stocks will drop below the minimum level for current production. (See chart below.)

Cutbacks Forecast—Many consumers will have to cut back manufacturing operations if the strike lasts until Sept. 15.

Most steel users still have ample stocks. But these signs of trouble are in evidence:

Some small steel users are now in serious inventory difficulty.

Spot shortages have developed for several products.

Premium prices have returned to the market.

The old steel broker has reappeared.

Some distributors are asking above-the-market prices.

Foreign steel prices are now equal—or above—those of domestic mills.

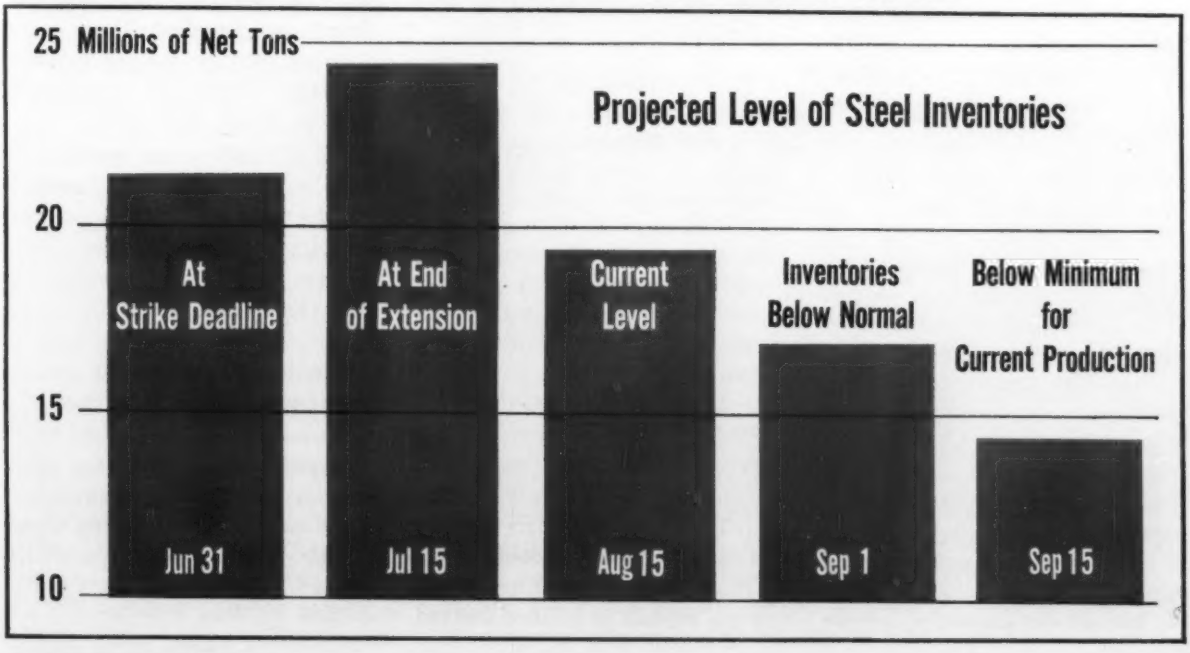
Post Strike Worries—Even after a strike settlement—which appears remote at the moment—the problems of steel consumers will not disappear. Here's why:

Producers will need time to start refilling orders. Assuming the strike lasts eight weeks, you can add another four weeks before mills will get back to full shipments.

"Look at it this way," says an Eastern mill representative, "when the strike started we were completely cleaned out of semi-finished stock behind our rolling mills. Before those mills start to produce again, we've got to give them steel to roll. Don't forget we were also operating with an order backlog of several weeks when the strike came. These customers must be supplied first."

Order Snarl Due — Estimates made earlier in the strike indicated it would take two weeks following

When Steel Users Will Feel the Pinch



"If the strike lasts six weeks, steel is going to be a lot shorter than anyone thought."—T. O. English, general purchasing agent, Aluminum Co. of America.

a month's shutdown for the mills to again hit 85 pct operations. Six weeks would be needed to reach the same producing level if the strike lasted two months.

When the strike does finally end, steel buyers will find themselves in one of the worst order snarls ever encountered. Steel mills, concerned about this prospect, are already holding sales meetings to decide courses of action.

Imports a Factor — Belief that foreign steel will help offset strike losses seems over-optimistic. Imports jumped from 200,000 tons in January to over 400,000 in June. July and August shipments are also heavy. But beyond that point, overseas deliveries may taper off.

Reason: European mills are booked at high levels. Prospects for shipment before the fourth quarter or even later are slim. This won't help steel users running short in the next few weeks.

Imports increased during the first half in those products now in the tightest supply. These include: Heavy structurals, plate, galvanized and cold-rolled sheet.

Military Steel Impact — Defense steel needs may also have an impact on the post-strike market. Currently the Iron and Steel Division of the Business and Defense Services Administration is keeping a close check on steel earmarked for defense and atomic energy programs.

They are asking buyers to include any priorities for steel on new orders. They are urging the operating mills to check on the percentage of their shipments going out on priority orders. And they are keeping tabs on the amount of defense steel tonnage ordered for September, October, and November.

After the strike, the government might insist, as it did following the 1956 strike, that all defense orders be filled within a certain period of time.

Warehouse Outlook—Steel service centers are also cooperating with the BDSA by making weekly checks on inventory levels. At the start of the strike, the warehouses had built up an estimated 3.7 million tons of steel—about a million tons more than at the beginning of the 1956 shutdown.

Currently this inventory is being depleted at the rate of 150,000 tons a week, according to Robert Welch, executive vice president of the American Steel Warehouse Assn. In mid-August, stocks were down to about 3.45 million tons. Mr. Welch estimates significant inventory holes could show up in another four weeks in carbon steel products. Alloy products will be hurting after several months.

What's Critical—Right now distributor inventories are relatively good with shortages showing up in only a few items. Several Detroit area warehouses report plates are especially tight. Supply troubles are also developing in heavy structurals, some bar shapes, and angles. Another service center says there are some areas where its stocks are either scraping bottom or about to do so. Listed as critical are galvanized sheets, wide plates, heavier sheets, and structural beams.

On the other hand, a Pittsburgh warehouse says customers are still not beating down the doors trying to place orders. Wide flange beams are the product in greatest demand —mainly to fill construction jobs already in progress.

Construction Hurt—Construction activity is hardest hit at the moment by supply problems. This was expected because most builders are generally not able to order far in advance. They must wait to place orders until they are awarded contracts. And they must specify steel tailored to their needs.

Large steel users—such as the automotive industry — are in the best inventory position. "We're in good shape," comments one automaker. "There won't be any interference with our production before November."

Says another, "We're not going to worry if we start production on 1960 models without the strike being settled. Our present supply of steel will carry us through approximately mid-November."

However this large independent carmaker disagrees with talk that auto steel supplies are "adequate."

Stamper Viewpoint — Stampers report they aren't hurting—yet. "We haven't had any problems so far," one states. "But some holes may show up in the next 10 days. When the strike came, we had enough steel for 60-90 days. If the stoppage lasts longer than that, we'll be bothered. One thing affected our supplies: There were schedule increases on old business we hadn't counted on and new orders we hadn't expected."

"If the strike lasts another 30 days we'll be hurting," another stamper points out. "There are spot shortages right now in some carbon supplies. What's more, warehouse prices have been creeping up slowly in the last month. We now have to ask our customers for their consent to pay premium prices for steel."

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

No Easy Way Out of Steel Strike

Both sides are so boxed in that strong measures may have to be used to break the stalemate.

But T-H injunction is opposed by union management, White House.—By Tom Campbell.

▪ The only way out of the steel strike impasse appears to be invocation of the Taft-Hartley 80-day cooling off provision. But from the way all concerned have boxed themselves in, that would solve little.

The steel industry does not want Taft-Hartley invoked. A reopening and then another shutdown at the end of 80 days would cost millions upon millions of dollars.

Union Opposed—The union does not want the Taft-Hartley "cooling off" period because it means nothing will be settled. It also means that chances of retroactivity in any wage increase would be that much harder to arrive at. But the main drawback to any union sanction rests with the horrible decision which the union would face—ordering the men back on strike a month before Christmas.

The Administration doesn't want Taft-Hartley because of the political overtones. Further, there would be no assurance that a settlement could be forthcoming.

Boxed In—The steel industry has boxed itself in with no chance of a settlement. It wants a non-inflationary agreement plus better contract language. It won't budge from this stand unless it is "forced" to do so. In that case, the biggest steel company—U. S. Steel—will raise prices to meet any agreement which it feels is inflationary. That's where the 12 steel firms—and the industry—stand. Chances of any reversal of this position are nil this week.

The union is boxed in because it feels it must get something to make up for a strike no one wanted. Whether union people want to admit it or not, the future of Dave McDonald and the union are at stake in this walkout. That means the union will demand a better economic deal than the one almost reached early July when both sides were within an ace of settling.

The President and his Administration have boxed themselves in. Mr. Nixon's attempt to settle the strike failed for some reason or other. The President has closed all doors to anything but the Taft-Hartley injunction. He has made it so plain that he wants a voluntary settlement that any attempt to use the backstairs of the White House appears unthinkable—at this time.

Khrushchev Factor—As to Mr. Khrushchev's visit and the steel strike: Obviously if White House pressure was exerted because of his visit the vehicle would be by the Taft-Hartley route on the basis of an emergency in the industry and not because of the visit per se.

At the rate things were going in the negotiations last week, and with all the sides well boxed in, it is clear that both sides are going to sweat it out. That will result in the most bitter and longest strike since 1919—if the strike lasts as long as now seems apparent—two to three months.

Who's a Messenger Boy?

CHARGE DENIED: Dave McDonald's charge that R. Conrad Cooper, above, and others in the four-man negotiating team are messenger boys brought a quick rebuttal. Mr. Cooper suggested that the union leader devote more time to "coming to grips with our message."

How Small Trucks Do Spot Jobs

An outgrowth of the golf cart, small industrial trucks are finding many uses.

They are particularly good for hauling small loads in narrow aisles, and doing jobs too small for larger trucks. — By T. M. Rohan.

▪ Small gasoline and electric powered buggies—first cousins to the powered golf cart—are tackling a host of new jobs in industry.

Their small size, maneuverability, speed and economy give them a big edge in handling spot jobs. The next step in their development is leasing, now being worked out.

Jobs Done—These are some of the jobs now being handled by these hauling mites:

Fleets of them are used for carrying people and small parts in the wide-open spaces of airplane plants.

One Cleveland firm has had so many in use that a traffic light system was installed along the aisles.

Another company uses them for spot jobs like mail delivery, payroll checks, refreshments, and small parts like bearings and emergency small components.

A new flat-bed type truck will carry a ton down an aisle only 44 in. wide.

Small fire trucks have been made out of them to get down narrow aisles in a hurry. They carry up to four men and fire and rescue equipment.

Plant guards and police can cover miles on them with just as close scrutiny as on foot.

From Motor Scooters—The little trucks are an outgrowth of motor scooters, but are generally less than 10 years old as an industry. About 30 manufacturers are in the business. Leaders are Cushman Motors, Victor Adding Machine, West Coaster, Kalamazoo Manufacturing Co., Buda Div. of Allis-Chalmers, and Mercury.

Many of the manufacturers backed into the business. Victor Adding Machine's experience was along that line. The company's president, A. C. Buehler, Jr., was golfing in California and rode a home-made cart.

Expansion Ahead — On returning to Chicago he called in his engineers and asked them to build a real one. They did, and the cart was the envy of the country club. Fellow members pleaded for them. And the adding machine company went into the electric cart business and is now among the largest. A new separate plant was started this year and annual production is about 1000.

Cushman motors got into the motor scooter line by a somewhat similar coincidence. Now it has expanded from motor scooters into industrial carts and is an industry leader.

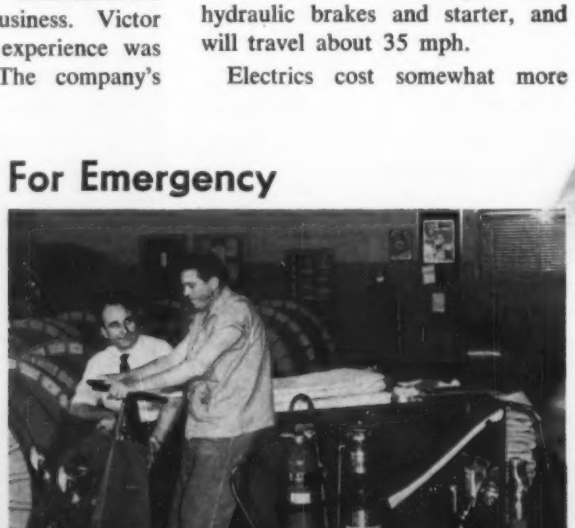
Gas vs. Electric — For in-plant use, gas vs. electric decisions are guided about the same as for lift trucks. Gas types operate similar to autos, with a clutch, gear shift, hydraulic brakes and starter, and will travel about 35 mph.

Electrics cost somewhat more

For Maintenance

WORK ASSET: A tired millwright would welcome this handy maintenance cart. (Victor photos)

For Emergency



FIRE TRUCK: This tiny fire truck can rush four men and equipment where big trucks can't move.

and will now generally run about two shifts while re-charging on the third. New models also have built-in chargers which can be plugged into regular 110-v lines during lunch periods and other idle time.

Leasing Plans—The next big development is leasing the little trucks to industry. Lee Fleet Management of Cleveland, a nationwide auto leasing firm, is breaking the ice with an exclusive franchise for leasing Victor electric cars. Rates and other details have not been worked out yet. Units like this sell for about $1000 up, and a deluxe fire engine will go to $2700.

Individual dealers are also looking into industrial leasing possibilities. Advantages are similar to other leased equipment—no capital investment, less maintenance worries.

Good Potential — "Our volume in industrial units is right up there with the golf cars," says H. E. Baker, president of Cushman Motor Scooter Sales of Cleveland, a dealer for 17 years. "We have leased golf carts for years and are now looking into industrial leasing. As it looks now, it would cost about $8000 to lease a fleet of 10 units for three years with renewal option. This is about the same money as they are worth. The plant would do routine minor servicing and we would handle larger repairs and maintenance."

Leasing firms are approaching the new development with caution. They feel it will work out better than golfing, even though the potential is not as great. Golf cart leasing has had some phenomenal successes as well as debacles. One manufacturer took back 900 carts when several firms folded.

Industrial leasing should be simpler. Year around usage will help. Also, smooth floors, few inclines. slower speeds and more experienced and better supervised drivers put industrial leasing on firm ground.

Labor Reform Bill Finally Makes It

It will take compromise between weak Senate and strong House version.

But bills have many provisions in common and conferees should come up with a bill soon.

▪ The final version of labor reform legislation being hammered out in Congress this week is called a "first step" by some clean-up advocates, such as racket-busting Sen. John L. McClellan.

But they admit it'll be another five years or so before any second step—such as trying to bring unions under the antitrust laws—can be taken. It'll take that long for the deep political wounds many lawmakers suffered in the current battle to heal.

In Conference — Senate and House conferees were working to iron out the differences only between a weak (Kennedy) bill and a mild (Griffin-Landrum) bill, in spite of the uproar from labor unions that they will be put out of business.

Even the House measure, termed "vicious" and "anti-labor" by AFL-CIO spokesmen, was far weaker than the measure originally introduced by Sen. McClellan, or that originally advocated by the Eisenhower Administration. Provisions for enforcement, penalties, member's rights, picketing, and misconduct, were all watered down.

The Provisions — The compromise Senate-House version will contain these provisions, which were not in controversy:

Unions and officers will have to file annual financial reports on income, spending, and investment; Union leaders will have to report any conflict of interest; Convicted criminals will be barred from holding union office; Elections will be required at minimum intervals.

Secret ballots will be required in electing delegates to national union conventions and in seeking to oust leaders accused of misconduct; Embezzlement of union funds could bring stiff fines and jail terms, and members are guaranteed free speech and other rights.

Both measures ban picketing to extort money from employers, and require employers to report funds spent to attempt to influence workers for or against a union and money paid to labor-relations consultants.

The Differences — The House bill bans virtually all secondary boycotts and blackmail picketing—picketing to force an employer or employees to recognize a union against their will. These are provisions President Eisenhower has demanded, but were not included in the Senate bill.

The House measure also gives state agencies and courts the power to enter labor disputes under state laws when the Federal National Labor Relations Board refuses jurisdiction. The Senate measure would permit state agencies only to enter a dispute and only under Federal law. President Eisenhower backs the House answer to this "no-man's-land" in collective bargaining.

The final version of the bill that emerges from Congress is bound to contain compromises. But in the final analysis, the principles it establishes are as important as the specific provisions. The traditional weapons of labor will not be affected. And the hoodlum elements will have to look for a new racket.

Military Spending

▪ Military spenders are drawing up their shopping lists, deciding how they will invest more than $39.2 billion in new funds.

Their budget for the year ending next June 30 is within $20 million of what they had asked. But the lawmakers did make some changes in the amounts approved for various activities.

Rate R & D High—They voted more for research and development, and for personnel than the budget requested. And they authorized less for operation, maintenance, and procurement.

In the anti-missile field, the Army has new financial encouragement. It can draw on $137 million in extra funds to step up the development of its Nike-Zeus antimissile missile.

Spend Against Subs—The Navy anti-submarine warfare program is also bolstered by an additional $137 million. These funds include $45 million specifically labelled for research. Also part of the $137 million is for another atomic-powered submarine.

More for Atlas — Procurement for the Atlas intercontinental missile project can be souped up. Congress gave the Air Force enough for 17 Atlas squadrons.

Tactical missile procurement by the Air Force appears to be slated for a drop. The service asked for $127 million to buy the Mace, a follow-up to the Matador. Congress approved no funds, but made this provision: If the Air Force can save the money from other programs, it can buy the Mace—if the Defense Secretary labels it "essential."

More Atoms at Sea—In the approved Navy budget, $35 million is for long-lead-time items for another atom-powered aircraft carrier. Total cost of the carrier is estimated at $380 million.

During the year that ends June 30, 1960, weapons, equipment, and other necessities will have to be bought for more than 2.5 million men in the regular forces.

Manpower—The Air Force, with 845,000 persons on duty, will man 102 air defense, tactical and strategic air wings. The Army will have 870,000 in 14 combat divisions. The Navy, with 630,000 men, will have 7,200 aircraft and 864 ships in operation. The Marine Corps, its strength restored to 300,000 men, will have three divisions and three air wings.

They Got About What They Asked

	President Asked	Congress Voted
Army	$ 8,985,000,000	$ 9,375,805,000
Navy	11,107,775,000	11,006,503,000
Air Force	17,767,200,000	17,472,706,000
Office of the Defense Secretary	1,388,225,000	1,373,225,000
TOTAL	$39,242,200,000	$39,228,239,000

National's Latest Expansion Moves

National Steel Corp. took two more steps in its $300 million expansion program by awarding contracts for major work at two of its plants.

At Great Lakes Steel, National's Detroit subsidiary, Salem-Brosius, Inc., Pittsburgh, will build four five-zone slab re-heating furnaces which National says will be the largest of the type in the world.

The Biggest — Their combined capacity will be 1000 tons of 30-ft-long slabs per hour. The slabs will then be rolled in the new 80-in hot strip mill, rated at 3.6 million tons of steel coils annually Great Lakes plans to build.

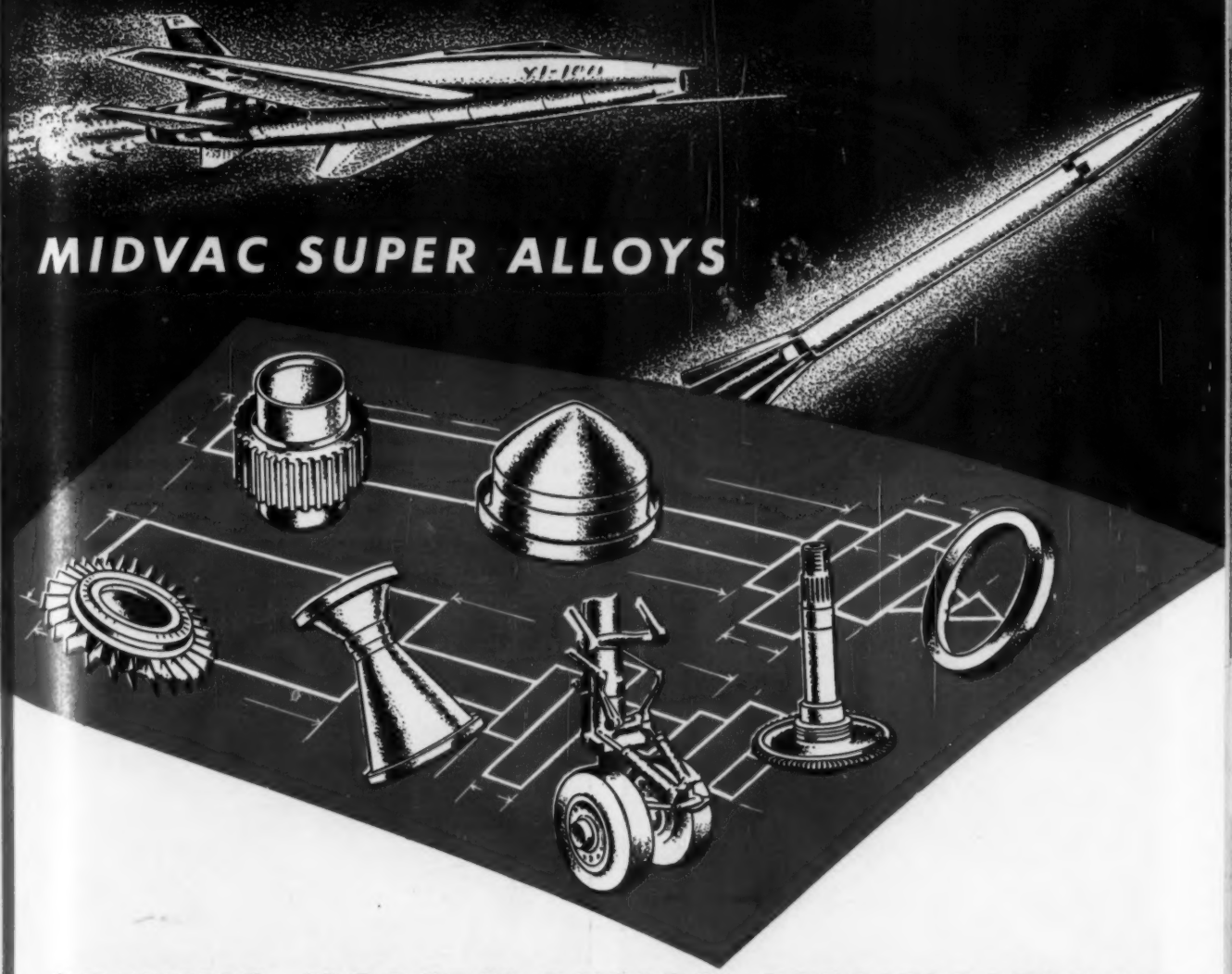
Eichleay Corp., Pittsburgh; and the Walsh Construction Co., Davenport, Ia., will install the foundations for all buildings, sanitary industrial waste sewers, drinking and service water lines, roads and railroad tracks for Midwest Steel Corp., National's new finishing plant at Portage, Ind. This is where National and several other steel companies beat off a bid by some of the local citizens to block building of steel facilities.

The same two construction companies will put in the foundations for the new 80-in. hot strip mill.

Fast Changeover Planned at Ford

Ford Motor Co.'s changeover from assembly of 1959 passenger cars to its new series of 1960 models is expected to be completed in near-record time.

Company assembly lines will be down an average of only two to three weeks after output of 1959 models ends late in August. All 17 facilities in the company's network will reopen before mid-September. Engineering advances in planning new models and production of new tools and dies well in advance of changeover have been mainly responsible for shortening the time.



MIDVAC SUPER ALLOYS

SOLVING MODERN DESIGN SPECIFICATIONS

Parts for Missiles—Rockets—Jet Engines are constantly calling for newer alloys to operate at higher temperatures. Alloys made by the Midvac process of consumable electrode melting are currently answering these needs and new ones are being developed in anticipation of more critical operations.

Midvac Alloys insure increased tensile and impact properties, improved stress rupture strength at elevated temperature, and longer fatigue life.

Standard commercial alloys can also be made with increased cleanliness resulting in higher properties than have been available under conventional means.

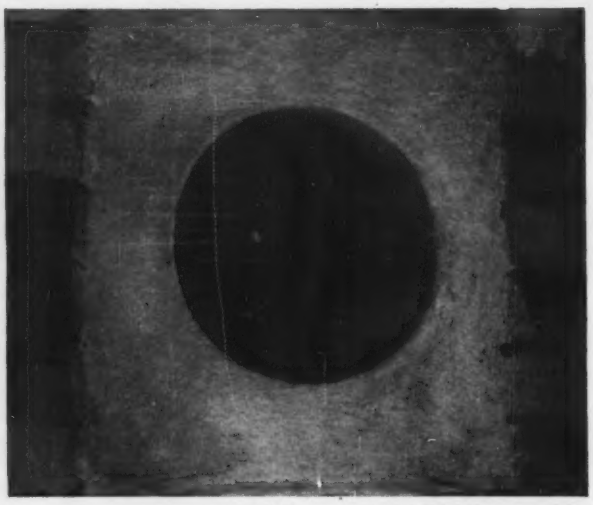
Offered in ingots, billets or forgings for the production of missile combustion chambers, tail cone assemblies, jet engine parts, aircraft landing gear components or any other parts requiring properties beyond the capabilities of conventional steels.

MidVac Steels

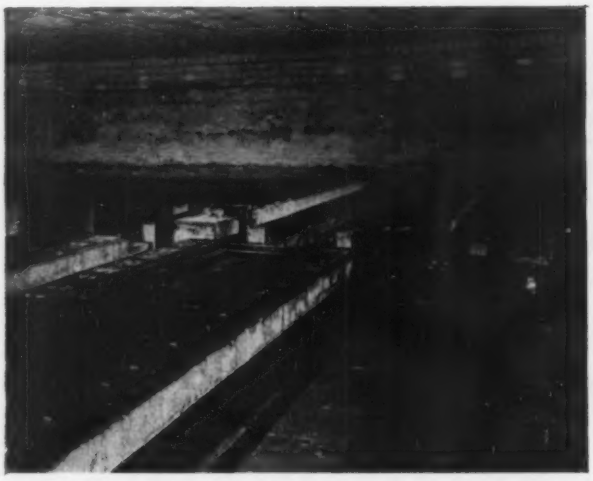
MIDVALE-HEPPENSTALL CO., NICETOWN, PHILADELPHIA 40, PA.

Subsidiary of HEPPENSTALL COMPANY, Pittsburgh, Pa.

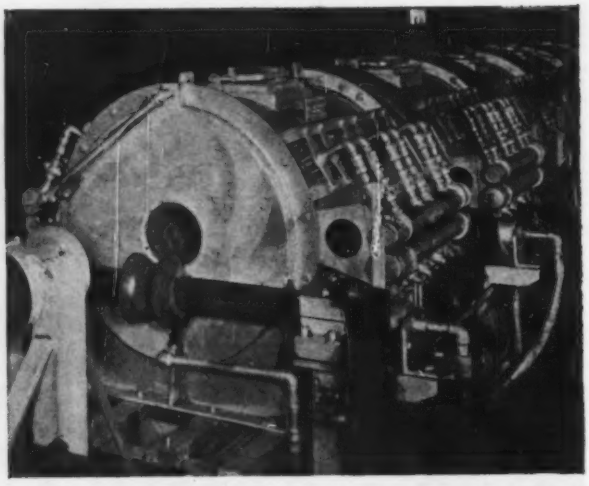
Electrode ports of this electric furnace roof are formed of B&W castable. B&W Kaocast or Kaocrete-32 can be successfully used, depending on severity of service.



High thermal release burner block is cast of B&W Kaocrete-32. Both Kaocrete-32 and Kaocast are used for burner blocks and other services in many other furnaces.



Nose arch of walking beam type furnace for heating forgings is made of Kaocast, B&W's 3000 degree castable. Kaocast is also used in forming complete forging furnaces.



This high speed barrel type heating furnace is typical of many which are completely lined with high temperature B&W Kaocast.

How B&W refractory castables solve high temperature problems

The higher temperatures in industrial processes have called for refractory castables that will stand up in these severe services. B&W offers two extremely durable, high temperature refractory products—Kaocrete-32 for applications up to 3200 F, and Kaocast with a 3000 F use limit. Both have high strength, unusual volume stability and excellent resistance to spalling and slag attack. Investigate B&W *specialized* refractory castables for solutions to your high temperature problems.

B&W Bulletin R-35A gives additional information on versatile B&W refractory castables. Write for copy to The Babcock & Wilcox Company, 161 East 42nd Street, New York 17, N.Y.

R620R

B&W THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

B&W Firebrick, Insulating Firebrick, and Refractory Castables, Plastics, Ramming Mixes, Mortars, and Ceramic Fiber.

Gifford V. Leece

Keeping Up With World Markets

While some are seeking Federal aid against imports, Mr. Leece is meeting foreign competition head on.

And he's competing where it hurts most, in the importers' home markets.

GIFFORD V. LEECE: "We will not be forced out of world markets."

▪ It is significant that 100-year-old Gardner-Denver Co. has its first export manager, Gifford V. Leece, as its president today. The company, which makes a wide range of mining, drilling, and construction equipment, has set its sights on capturing a larger share of world markets.

The policy laid down by Mr. Leece at Gardner-Denver is one aimed at meeting foreign competition head-on. Says Mr. Leece:

"We have decided we will not be forced out of world markets. If we must open new plants overseas to bypass tariffs and price barriers, we will do it in the future as we have in the past."

Export Pays Off—Mr. Leece and Gardner-Denver have the know-how to back up this policy. At the moment, the Quincy, Ill., company has 13 plants in four continents and 47 sales offices throughout the world. Practically all of the foreign interests were developed under Mr. Leece's guiding hand.

This aggressive overseas program has helped Gardner-Denver record the highest sales and earnings in its history. Since Mr. Leece was elected president in 1954, the firm has added two divisions through mergers, expanded product lines, and moved into new fields. It has more than doubled sales and earnings.

Key to Success—"Our company has prospered by making substantial contributions to the basic industries of mining, construction, petroleum, and production," he explains. "For example, we recently introduced a draw-works for drilling oil wells to any depth foreseeable in the next 10 years."

Mr. Leece sets an example for other members of the Gardner-Denver family by driving himself hard. In this way, he moved through the ranks to his company's highest post.

A native of Bishop, Calif., he attended the University of Southern California and served a hitch in the Army before joining Gardner-Denver 36 years ago.

He started in the production department at Quincy but soon became a field salesman. On his way up in the sales department, he was transferred to New York where he organized the export department. He eventually returned to Quincy as general sales manager and then was elected vice president.

Puts in Long Day—The end of a long day at the office for Mr. Leece is often the start of another period of work for the community. He is active in civic organizations.

Mr. Leece even relaxes vigorously. For two weeks each fall, he hunts and fishes at his lodge in Colorado. "Vigor has made Gardner-Denver grow for 100 years," he says. "It is the key to our future growth at home and abroad."

how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 180 N. Wabash Ave., Chicago 1, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®
by Cromwell
For over 38 years—
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Correct Way to Analyze Profits

Attempts to analyze earnings by looking at them in a vacuum are often misleading.

The result is a distorted picture of both their size and their function.

▪ You can't accurately analyze record first half profits by tearing them loose from their economic framework.

Attempts to do just that have lead to claims that business earnings in the first half were "excessive." This isolating of profits for economic study is like lifting quotes out of context. It gives a distorted picture of both their size and their function.

Nothing Surplus—It can lead, for example, to the belief that profits are "surplus" funds, available solely for distribution among employees, management, and stockholders.

In reality, earnings have a far more important role—that of helping underwrite the future success of a business. They are a prime source for the money needed to modernize and expand facilities, discover new products, develop new markets, and provide future employment.

Reaction to Steel — Recently when second quarter steel profits were announced, attention was given the increased return on sales which some companies made. But less notice was given one of the reasons which made these returns possible—the funds poured into enlarging and improving facilities.

Since World War II the top twelve steelmakers in the U. S. have more than doubled their capital investment, raising it from $3.3 billion to $8.5 billion.

Talking Points—Profits are the benchmark by which a company is judged. An attractive earnings rate helps interest new stockholders. A sound profit position is important when a company wants to borrow money for expansion or improvement. Companies needing financing must compete with other firms, with the government, and with private borrowers.

Finally, it is a mistake to label profits as "large" without considering overall growth of the economy. In the second quarter the nation achieved a gross national product estimated at an annual rate of $483 billion. Economists are talking about the prospect of a $500 billion GNP by the end of the year. That would mean an economy of half a trillion dollars.

Within such a framework, with expanding capital investment, widening markets, and increased sales volume, it's understandable and logical that earnings should also increase.

Prod for Defense Contractors

▪ Among all the ill effects of the steel strike there's one small benefit. Defense contractors, seeing many of their sources for steel dry up, are finally realizing the value of including priority ratings on their orders.

For a long time the Business and Defense Services Administration has been urging contractors to include priorities when buying steel. But, especially among sub-contractors, there's often been a tendency to forget them.

Easy Market Attitude—This was encouraged, of course, by the relatively easy market for steel. In such conditions, the priority paperwork hardly seemed worth while.

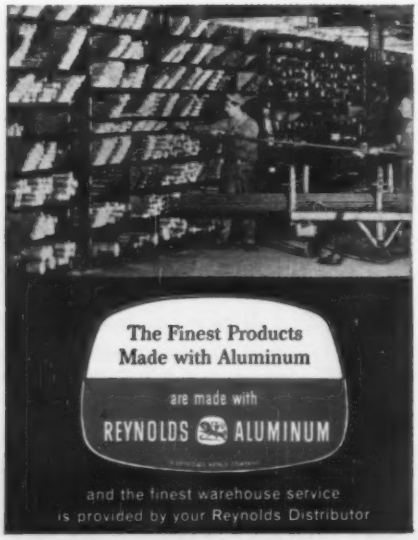
But the advent of the strike had the effect of a cold shower on the defense contractors. They are now making sure all orders are accompanied by the defense ratings. In addition, steel mills still operating are also urging customers to include the needed data.

Urged By BDSA—Both the mills and the contractors were stirred to action by reminders from the BDSA. Companies handling defense orders were asked to send in a weekly report on the controlled material orders they accepted. They were also urged to advise of any work stoppages caused by steel shortages.

The non-struck steel companies were reminded of their "obligations under the Defense Materials System (to provide) preferential treatment in filling orders for controlled materials for Department of Defense and Atomic Energy Commission programs. . . ." Those already handling defense orders were asked for a report by products on the tonnage accepted for September, October, and November delivery.

Right now a revision of defense materials regulations is being worked out. This revision—in the planning stage for the past few months—is certain to get greater attention and compliance. Experience of the contractors with supply problems during the present strike seems likely to insure that.

"I made warehouse space into working space . . . by relying on the Reynolds Distributor for all my aluminum stock."



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He can often cut your fabricating costs by supplying the exact alloy for fastest machining . . or by providing the size that means minimum scrap. Even more than that, he saves you floor space by stocking a complete selection of aluminum products you might need . . . in quantities you might call for. You never have to carry a surplus of aluminum that costs money every day it's not used. Your Reynolds Distributor has it, and he can get it to you *fast!*

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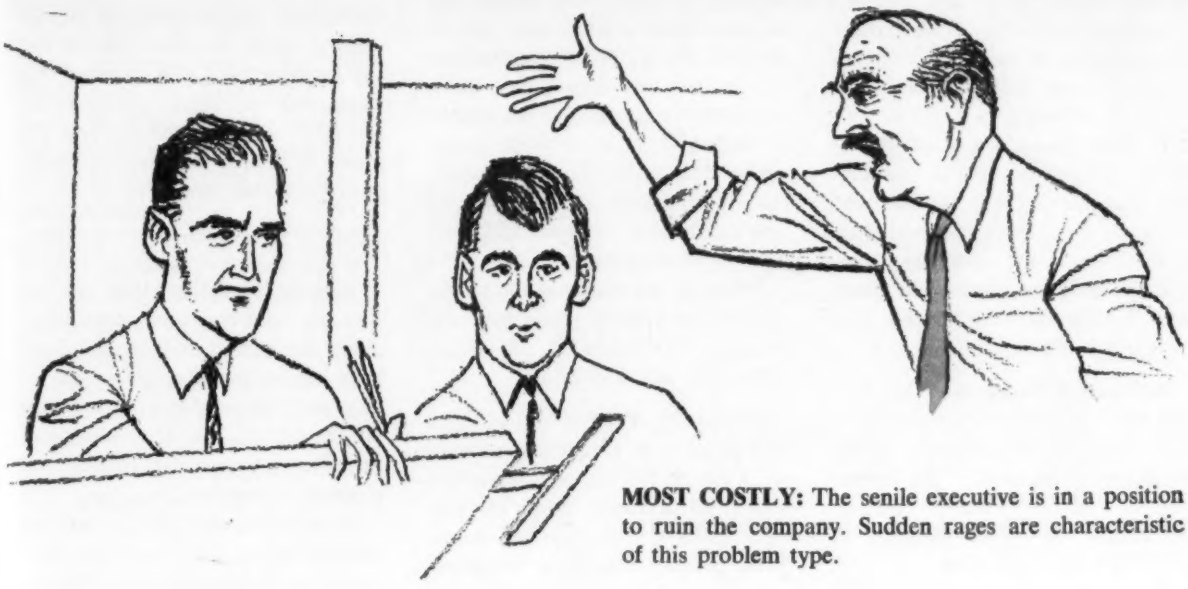


MOST COSTLY: The senile executive is in a position to ruin the company. Sudden rages are characteristic of this problem type.

What's Management's Obligation To Its Problem Employees?

By Robert N. McMurry, President, The McMurry Company, Chicago

Management has definite limits to its obligation to problem employees.

For the most serious problem types, who can injure the company, separation may be the only answer.

▪ Among problem employees, one category is by far the most serious.

First, it is most difficult to detect. And the problem people may be in positions where their form of problem behavior can hamstring the company.

In this group are the senile executive, the brilliant malcontent, and the psychopathic personalities.

In contrast to other problem types, they generally can not respond to firm management, or reassignment to positions that fit their personalities. These measures are successful with many of the less serious cases.

Senile Executive—Of all of the dangerous types, the most costly, potentially, and frequently the most pitiful is found in the senile executives. Their cases are extremely hard to detect because their onset is gradual, often extending over several years.

Furthermore, even considerable deterioration may be masked by the fact that skills and information which have been acquired earlier are rarely lost.

The trouble lies in the fact that he loses his capacity to acquire new material. He cannot learn. Neither can he remember recent events.

In addition, he is often prone to become confused, disorganized, suspicious. As his condition advances, he may become subject to sudden rages. Since he, himself, usually senses that he is failing, he may also become resentful of those who, in his judgment, have become threats to him.

Must Be Removed—Most seri-

The Problem Employee
Part 3 of a Series

MANAGEMENT'S DUTY: In this last of the series, Dr. McMurry discusses limits of management's responsibility to its problem employees. There is a point where this responsibility to the workers comes to an end.

ous, his efforts to make decisions are fraught with danger. He tends to cling to the status quo ante because this is familiar. Nevertheless, his approach to problems becomes confused and disorganized, with overtones of panic.

If there are evidences of any of these symptoms, it is imperative that the sufferer be removed from any position of responsibility. Even if he is the company president, he must be removed at once, even though he may protest that he is still in the best of shape.

Brilliant Malcontent—The second type of problem employee in this most serious category is the intelligent professional. He is extremely difficult to detect because, technically, he is not mentally ill or recognizably aberrant.

For want of a better term, he may be said to suffer from "character neurosis." He is not altogether realistic in his thinking, yet is sufficiently in touch with reality that he can make a good case for his position. He is a skilled rationalizer.

It is for this reason that he is especially dangerous. He is basically a nihilist, a rebel without cause, whose destructive impulses are directed principally at authority figures and holders of power and prestige—or management.

While he nominally is the champion of the underdog, his true, underlying motivation is to attack, embarrass and hamstring.

Personality Pattern — This type of individual is frequently encountered among the so-called often self-styled intellectuals. It is he who often gives the term a bad name. Such persons exhibit a consistent and characteristic personality configuration.

THE HATER: The man who flouts the rules openly, or challenges authority, is dangerous to morale. Reasoning won't help him change.

NEXT WEEK

MODERN MARKETING: Beginning a series of three articles on: (1) Introducing a new product; (2) organizing customer - prospect list for more effective selling; and (3) a new technique for covering major customers and prospects.

Without exception, they are essentially passive and dependent, albeit demanding, individuals. They have never become truly self-reliant and independent, but have retained the child's demanding dependence on parental figures and parental substitutes.

In many cases, he is brilliant intellectually, and is often well equipped technically. But because he is inherently passive and dependent, and a little lazy as well, he does not make the progress he should. Instead, he sees others who are, in his estimation, his inferiors move into positions of affluence, power and influence.

Time to Go—He is particularly dangerous because his hatred of authority and position is implacable and because, being weak, he will not openly attack management, but will bore from within and do great damage to morale.

If management is aware of his goals and activities, he may sometimes be contained. As a rule, however, this is difficult to do.

Hence, in spite of his often excellent technical competence, the company is usually better off without him.

The Hater—The final type of problem employee in this most serious category is also a "man who hates," but he is a different class. This type tends to be of middle or low intelligence and with comparatively little education. They are in the same class with the petty criminal and small-time racketeer. It is from their ranks that most of the labor goons are recruited.

Flout Authority—They tend to be unproductive, to abuse equip-

ment, to waste materials. They often engage in outright sabotage. They are the swaggering insubordinates who flout shop rules and intimidate their supervisors. They are troublemakers par excellence.

Such employees, when recognized, must be separated as quickly as possible. Where there is a probationary period, all employees must be scrutinized carefully for evidence of these tendencies. If there is a clear indication, he must be discharged at once.

If the employee has passed the probationary period, nothing remains but to begin to "build a case on him." It is a waste of time to reason with such persons.

But ultimately, they must be separated. They are neither productive workers nor are they good for the morale of the group.

Employer Obligation—The overwhelming majority of every company's employees are good, loyal, hard-working people. They seek primarily security and an orderly, predictable environment in which to work. Unfortunately, a minority will be found who do not conform to the standards of the employer.

While he has an obligation to provide adequate compensation, good working conditions and protection against usual hazards of the job, he is under no responsibility to maintain a rehabilitation center.

He should take an inventory of his personnel at intervals in the same systematic fashion he uses in inventorying and maintaining his plant and equipment.

If some people are improperly placed, it is his obligation to put them where they belong. If they need further training, he must provide it. If they need special help this must also be provided.

But on the other hand, if it is apparent that an employee is inescapably incompetent and is lazy, irresponsible, or an overt troublemaker, he has no duty to keep him.

Management's Duty — Many members of management have been handicapped because they have a wrong conception, first, of their obligations to their people and, second, of what should and can be done to cope with those who have become problems.

The aim of this series is to point out not only that the employer's obligations are finite in their extent, but also that his potential to improve and change people is correspondingly also limited.

Within this framework, two principle courses are open to him.

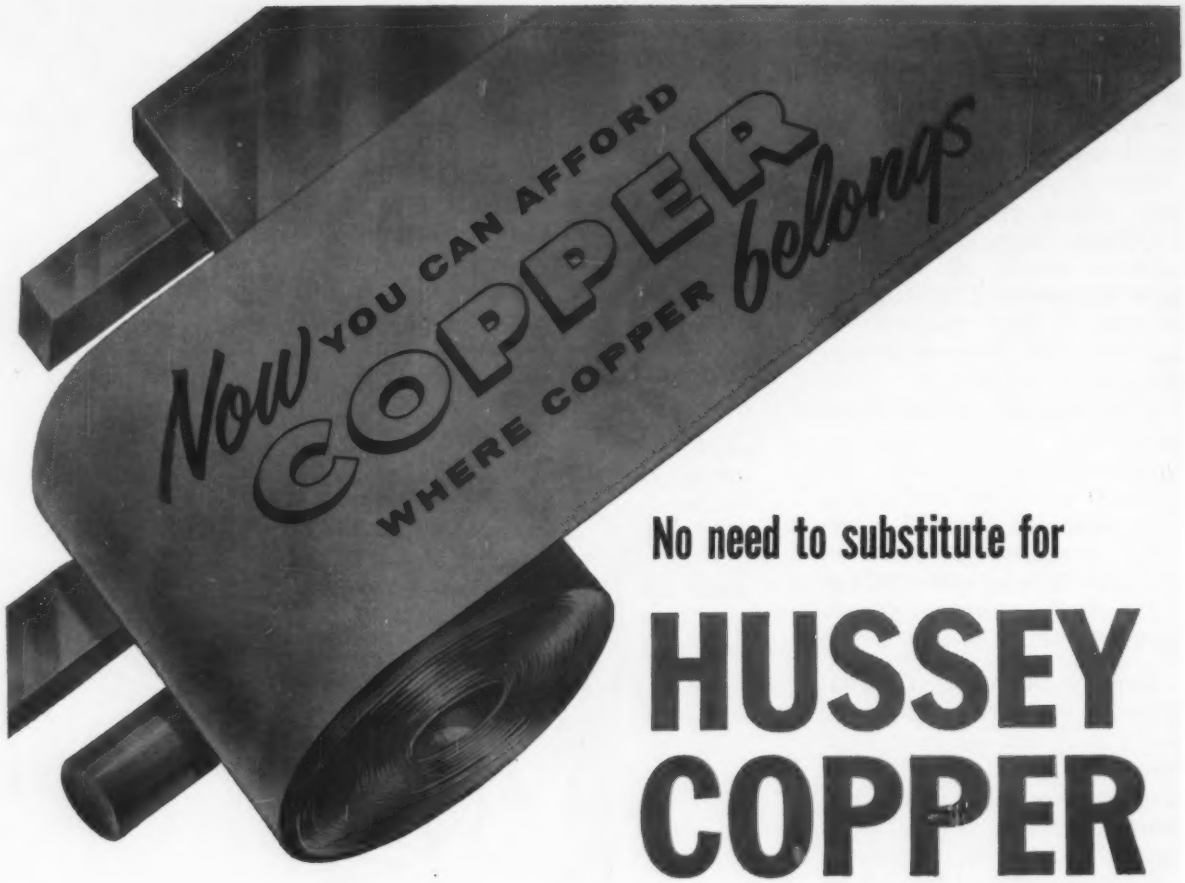
1. For the minor problem cases, to provide more job structuring and tauter supervision. Where placement has been faulty, it must be corrected.

2. For the more serious cases (the maladjusted, the senile, the anti-management and the psychopaths) to take the more critical step of separating the offending employee on the ground that rehabilitation is unlikely and impractical.

It is customary to eliminate those who cannot do their jobs; why not those who will not or are chronic troublemakers.

WHOM TO HELP: Many problem employees can be helped. Managament should take regular personnel inventories to determine steps to take.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



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Stopping Trouble at the Source

Chrysler's Rustproofing Should Add to Car Life

1960 Chrysler Corp. models will have their integral bodies rust-proofed in an $18 million, continuous process.

The new system is aimed at adding to car life, cutting maintenance costs.—By A. E. Fleming.

▪ A new $18 million dip rustproofing system in Chrysler Corp's body plants will help protect 1960 Plymouth, Dodge, De Soto, Chrysler, Valiant and Dart cars against rust and corrosion.

The electronically-controlled process of cleaning and drying, heating and cooling, rinsing, priming and painting will give full protection to every part of the auto body.

For Longer Life—According to R. S. Bright, Chrysler Corp's group vice president-Automotive Manufacturing, the multi-million dollar program will result in "longer vehicle life, less upkeep cost, all around year-in, year-out better appearance and a new plateau of safety."

The dip method of rustproofing, in which cars are literally dunked into tanks containing anti-corrosive solutions, is peculiar to cars with integral-type construction, such as the 1959 model Rambler, Lincoln and Thunderbird. All Chrysler cars except Imperial will switch to this design in 1960.

Long Process — Chrysler's dipping technique was perfected after four years of laboratory testing and a quarter million miles of test driving on water-splashed, chloride-treated roads.

The anti-corrosion phase alone takes an hour and 45 minutes to complete on a roller-coaster conveyor encased in a tunnel more than 2300 ft long. About 60 cars an hour will move through the system. During peak production periods, 16,800 gal of primer — a

Checking Bumps and Rolls Scientifically

TAKES TWO: To work out complicated suspension problems, engineers at the GM Research Laboratories hook up a giant analog computer to a unique ride simulator, complete with driver. The simulator can be made to pitch, bounce or roll, as a car might on the road, for the computor to record.

water reducible armor plating — will be used daily.

Starts With Coils—Rustproofing starts when steel arrives in coils and sheets from the mills. It is given three intensive spray baths of caustic metal cleaner to remove every trace of oil and dirt. It is coated with a special drawing compound as it moves through the blanking and stamping operations and into the body building departments.

Step By Step—When the body of the car has been completed it moves along the assembly line to the anti-corrosion tunnel, where the following steps are taken:

1—The body is immersed to a depth of 18 in. up to the car's belt line in a tank of alkaline cleaner for three minutes while high-intensity alkaline sprays soak the upper portion of the auto. The water at this stage is about 180°F.

The electronic controls start the assembly line conveyor. The car rises out of the bath and the sprays stop. The next car is right behind as the first one gets a 50-second drain period.

2—A 30-second water rinse at 150-160°.

3—A second clear water rinsing with the liquid temperature lowered 10°.

4—The car travels downward to the low point of the roller coaster conveyor for an immersion in 18 in. of phosphate coating. High intensity sprays cover the upper portions.

5—The car is taken out of the bath for a 50-second drainage, then dropped into a 30-second cold water rinse.

6—A chromic acid conditioner bath and spray for a 30-second period at temperatures ranging from 140 to 150°. The body is drained, rinsed and air dried at high pressure and continues on through a drying oven for three minutes at 225°. Hot air jets are continuously in use to ensure complete drying. The body is then cooled to room temperature.

Automotive Production

WEEK ENDING	CARS	TRUCKS
Aug. 15, 1959*	72,745	11,861
Aug. 8, 1959	108,240	11,200
Aug. 16, 1958	59,677	12,976
Aug. 9, 1958	65,614	15,452
TO DATE 1959	3,838,402	767,574
TO DATE 1958	2,563,373	513,574

*Preliminary Source: Ward's Reports

7—The body gets the anti-corrosion bath with a gray-colored water-reducible primer paint. The body dips into the 9,000-gal tank to a depth of about 18 in., and after soaking for 90 seconds, rises up from the paint and travels into the drainage area.

All Done — This completes the anti-corrosion dipping and spraying operations. The body then travels on the same conveyor belt into seven stages of external finishing operations. These include two coats of epoxy primer paint; oven-baking at between 350 and 370°; wet-sanding operations; first and second coats of lustre bond enamel; and oven-baking at 250° to complete the body corrosion protection.

Chrysler Corp. engineers say this method of finishing both the underbody and surface should result in the most durable finish ever offered in the auto industry.

The Bull of the Woods

Rambler Doubles

Rambler production during the 1959 model year totaled a record 374,240 units, more than double the 162,182 units turned out in the 1958 model period.

The high demand for Rambler cars during the year resulted in almost continuous two and three-shift, six-day working schedules at the final assembly plant in Kenosha, Wis., during the recently-completed run. New weekly and monthly output records were set throughout most of the year.

Production of 1960 models is scheduled to begin Aug. 31.

GENERALLY AVAILABLE ROUND SIZES* (B. W. G.)

Size of Tubes	CARBON		STAINLESS
	Cold Rolled	Hot Rolled	
⅛			20-25
¼			16-25
⅜	14-22		16-25
½	14-22		14-25
⅝	13-22		14-25
¾	13-22	13-16	12-25
⅞	13-22	13-16	12-25
1	11-22	11-16	11-25
1⅛	11-22	11-16	11-25
1¼	11-22	11-16	11-25
1⅜	11-22	11-16	10-23
1½	11-20	10-16	10-23
1⅝	11-20	8-16	10-23
1¾	11-20	8-16	10-23
1⅞	11-20	7-16	10-23
2	11-20	6-16	9-23
2⅛	11-20	6-16	9-22
2¼	11-20	5-16	9-22
2⅜	11-18	5-16	8-22
2½	11-18	4-16	8-22
2⅝	11-18	4-16	8-21
2¾	11-18	4-16	8-21
2⅞	11-18	4-16	8-20
3	11-18	4-16	8-20
3⅛	11-18	3-16	8-20
3¼	11-18	3-16	8-20
3⅜	11-18	3-16	8-20
3½	11-18	3-16	8-20
3⅝	11-18	3-16	8-20
3¾	11-18	3-16	8-20
3⅞	11-18	3-16	8-20
4	11-18	3-16	8-20
4⅛	11-16	3-16	8-18
4¼	11-16	3-16	8-16
4⅜	11-16	3-16	8-16
4½	11-16	3-16	8-20
4⅝	11-16	3-16	8-18
4¾	11-16	3-16	8-18
4⅞	11-16	3-16	8-18
5	11-16	3-16	8-18
5½	11-16	3-16	—
6	11-16	3-16	9-20

*Intermediate sizes, also larger and smaller sizes and heavier walls are available. Square, rectangular and other tubing shapes are also available in peripheries from 1" to 20" inc.

CARBON GRADES

Grade Designation	Carbon %	Manganese %	Phosphorus % Max.	Sulphur % Max.
MT 1010	0.05/0.15	0.30/0.60	0.040	0.050
MT 1015	0.10/0.20	0.30/0.60	0.040	0.050
MT X1015	0.10/0.20	0.60/0.90	0.040	0.050
MT 1020	0.15/0.25	0.30/0.60	0.040	0.050
MT X1020	0.15/0.25	0.70/1.00	0.040	0.050

HIGHER CARBON AND ALLOYS

Grade Designation	Carbon %	Manganese %	Phosphorus % Max.	Sulphur % Max.
C 1025	0.21/0.28	0.30/0.60	0.040	0.050
C 1026	0.21/0.28	0.60/0.90	0.040	0.050
C 1030	0.27/0.35	0.60/0.90	0.040	0.050
C 1035	0.31/0.39	0.60/0.90	0.040	0.050

STAINLESS STEEL PIPE SIZES

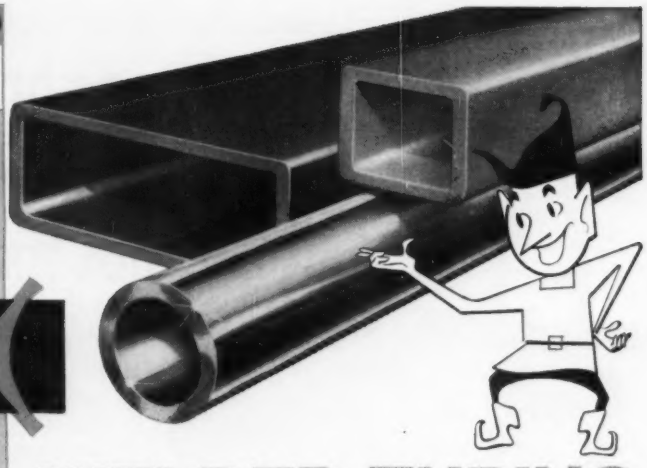
Stainless Steel Pipe Sizes are available from ⅛" I.P.S. through 2" I.P.S. in A.S.A. schedule 40S; from ⅛" I.P.S. through 4" I.P.S. in schedule 10S; and from ½" I.P.S. through 4" I.P.S. in schedule 5S wall thicknesses. Inquiries for larger diameters should be referred to a quality stainless steel pipe producer listed below.

STAINLESS GRADES

Type No.	Carbon (*)	Chromium	Nickel	Other Elements
302	.15	17-19	8-10	....
304	.08	18-20	8-12	....
304L	.03	18-20	8-12	....
309	.20	22-24	12-15	....
309S	.08	22-24	12-15	....
309SCB	.08	22-24	12-15	cb10XC Minimum—1 Maximum
310	.25	24-26	19-22	....
310S	.08	24-26	19-22	....
316	.08	16-18	10-14	Mo. 2-3
316L	.03	16-18	10-14	Mo. 2-3
317	.08	18-20	11-15	Mo. 3-4
321	.08	17-19	9-12	Ti 5 X C Minimum
329	.20	23-28	2½-5	Mo. 1-2
330	.15	14-16	33-36	....
347	.08	17-19	9-13	Cb-Ta 10 X C Minimum
348	.08	17-19	9-13	CB-Ta 10 X C Minimum Ta .10 Maximum
430	.12	14-18	....	....
442	.20	18-23	....	....
443	.20	18-23	....	Cu .9-1.25

(*) Maximum—unless otherwise indicated.

LC-592



WELDED TUBING *offers*

- **THE SIZE**
- **THE GRADE**
- **THE SHAPE**

For a versatile tubular product, nothing equals Welded Steel Tubing. The quality producers offer a broad range of sizes and wall thicknesses in all weldable grades of carbon, stainless steel and other alloys. It is particularly adapted to shapes ranging from round, square and rectangular to the most complex special cross sections.

Welded Steel Tubing—as manufactured by the quality tube producers—offers a concise answer to most design problems. Specify Welded Tubing on your next order.

FORMED STEEL TUBE INSTITUTE, INC.

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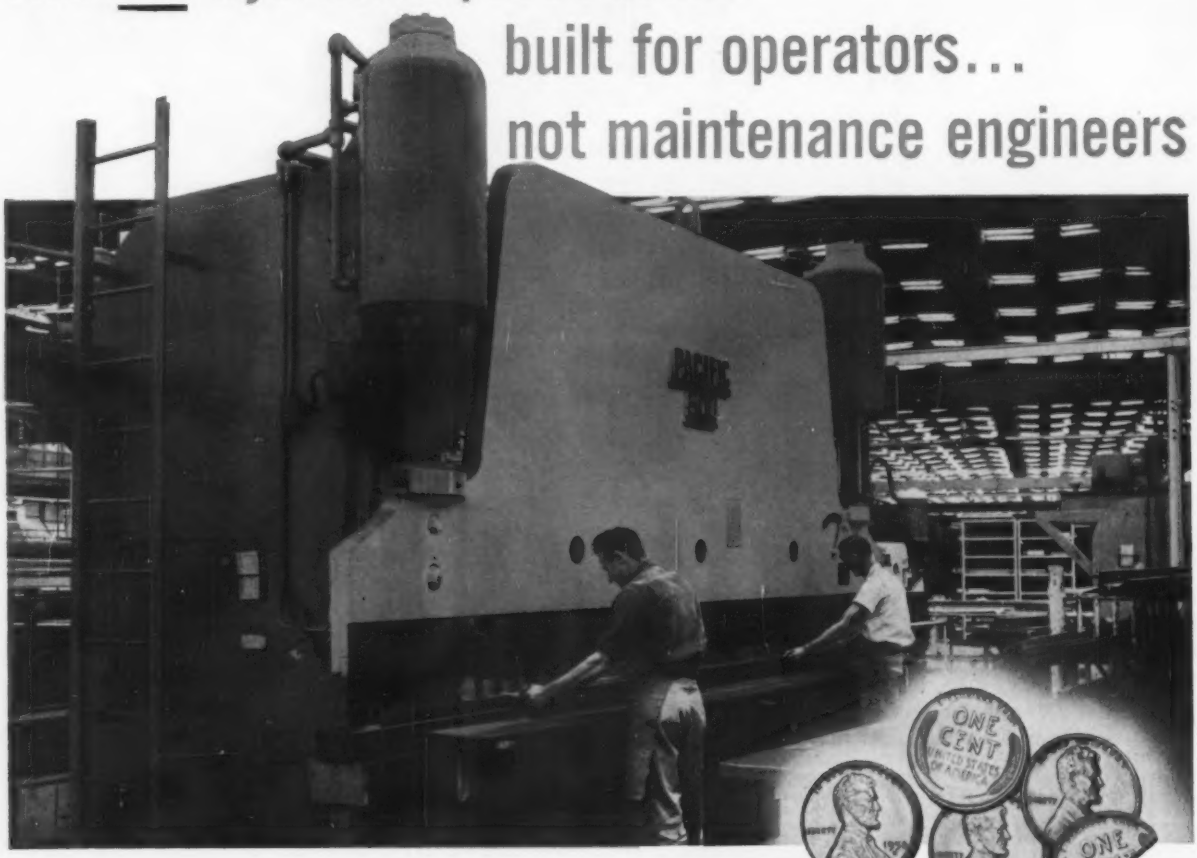
• Armco Steel Corp. • The Babcock & Wilcox Co., Tubular Products Div. • The Carpenter Steel Co., Alloy Tube Div. • Clayton Mark & Co. • Damascus Tube Co. • Jones & Laughlin Steel Corp., Electricweld Tube Div. • National Tube Div., United States Steel Corp. • Ohio Seamless Tube Div. of Copperweld Steel Co. • Republic Steel Corp., Steel and Tubes Div. • Revere Copper and Brass Inc., Rome Manufacturing Company Div. • Sawhill Tubular Products, Inc. • Southeastern Metals Co. • The Standard Tube Co. • Standard Tube and T. I. Ltd., (Canada) • Superior Tube Co. • Trent Tube Co., Subs. Crucible Steel Co. of America • Van Huffel Tube Corp. • Wall Tube & Metal Products Co.

The one hydraulic press brake built for operators... not maintenance engineers



To all outward appearances many hydraulic press brakes may *seem* alike but that is where the similarity ends. Inside the PACIFIC is the most sensibly simple, patented level control system ever devised . . . only 6 microswitches and 2 relays provide the precise PACIFIC accuracy that no other hydraulic press brake can even remotely approach. Free of lineal variable differential transmitters, electronic amplifiers, photo-electric relays, amplidyne generators, complex hydraulic servo-valves, variable volume pumps and other complicated gadgets, PACIFIC hydraulic press brake can be kept in continuous operation by the ordinary plant maintenance man without the costly services of a professional hydraulic or electronic engineer from some distant factory. PACIFIC can be maintained for pennies per operating hour . . . only a fraction of the cost of the complicated machines.

Costs only 4.4¢ per hr. to maintain . . .

EARNS $7.50 NET PER HOUR

Pacific Hydraulic Press Brake at Atlas Universal Service, Inc., San Francisco, has operated continuously 16 hours a day for 9 years and 27 days with average maintenance downtime of only 5.2 hours per year and a total maintenance expense of 4.4¢ per operating hour.

Write for brochure

PACIFIC INDUSTRIAL MANUFACTURING COMPANY

PACIFIC HYDRAULIC BRAKE

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OAKLAND, CALIF. and MT. CARMEL, ILL.

DISTRIBUTORS:
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Door to More Red Trade Shut

New Commerce Dept. Head Won't Ease Restrictions

Secretary Mueller says he is for more Russian trade if and when it would benefit us.

But he's taking great pains to be sure that nothing we send could ever be shot back at us. —By G. H. Baker.

▪ Trade with the USSR won't increase much this year or next.

Frederick H. Mueller, Ike's new Secretary of Commerce, is making it clear he has no intention of easing existing U. S. rules against shipment of strategic goods to Communist countries.

For Peace — Secretary Mueller will thus be carrying on a national policy, pursued by both the Eisenhower and Truman Administrations, of permitting the export to Soviet-bloc countries of non-military goods only.

Not only the implements of war, but the tools to make them are on a long list of items barred from shipment to Communist ports. Transshipment through neutral foreign ports is likewise forbidden.

Take Care—Conceding that this year's exchange visits of heads of state between the U. S. and Russia has done much to ease tension between the two, Mr. Mueller nevertheless points out he intends to license for export only those items that can't be shot back at us.

The U. S. is willing—even eager —to trade with the Reds, provided, as the Commerce Secretary puts it, "such commerce is not contrary to U. S. foreign policy and is not detrimental to our national security."

Actually, the law already permits several thousand items to be shipped to the USSR without export license.

Good for Both—"We favor more commerce in nonstrategic goods with the Russian people," Secretary Mueller affirms. "If it is to flourish, it must be mutually advantageous.

"Whenever trade in peaceful goods is to our advantage, as well as theirs, we are willing to do more business with the Soviet Union. And we are willing to explore new methods of approach to such trade, consistent with our national interest," he promises.

Railroad Asks Backing

Government backing for a loan of $6 million for new equipment and improvements, is asked by the Lehigh Valley Railroad.

The rail line wants the Interstate Commerce Commission to use its loan guaranty authority to support the loan. Arrangements for the money are to be made with private lenders. The Lehigh Valley wants the guaranty to become effective by Oct. 15.

Congress Acts to Block Tax

Every Little Bit Helps—Business firms may get some temporary relief from some state income taxes this year.

The House Judiciary Committee in a surprise move followed the Senate Finance Committee in approving stop-gap legislation to curb the right of states to tax income of out-of-state firms.

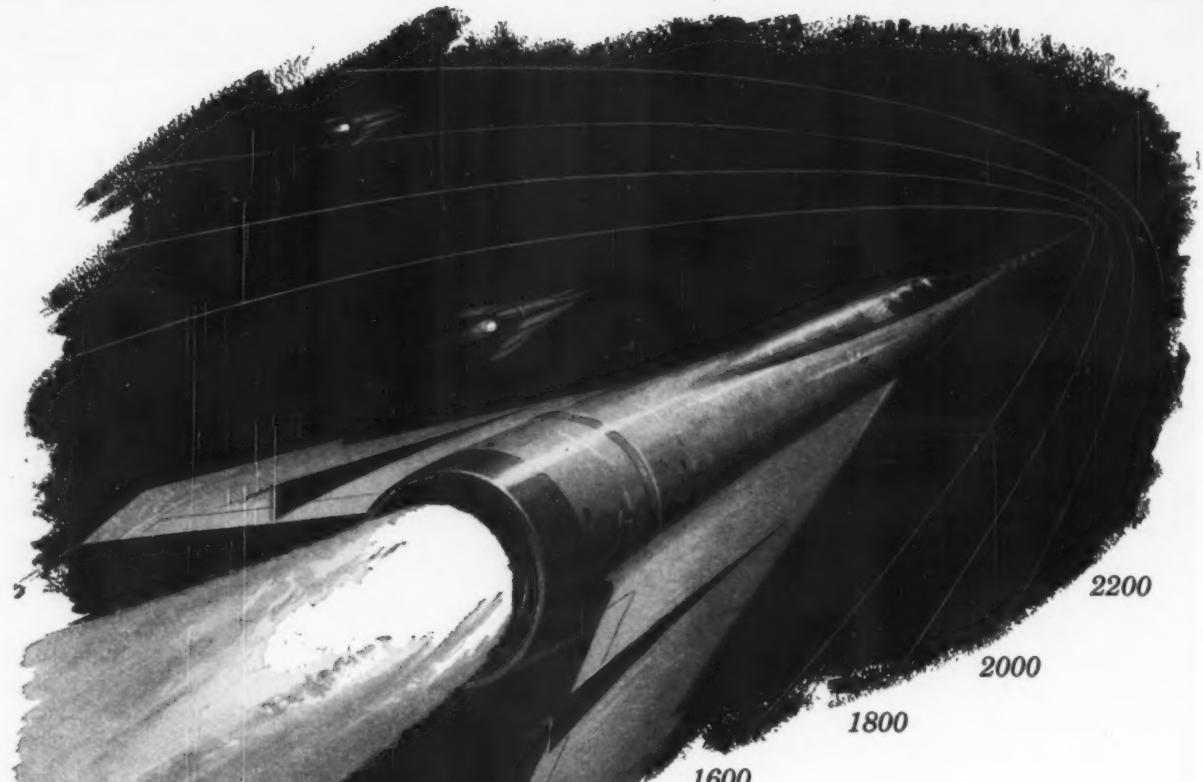
Hair Apart—The two bills differ slightly. Both would prohibit a state or political subdivision from taxing income of a firm engaged in interstate commerce unless the firm maintains an office, salable inventory, warehouse, or "other place of business" in that state, or has an officer, agent, or salesman who maintains an office or other place of business.

The Senate measure would permit states to tax agents who work for themselves, or who solicit sales for more than one firm. The House measure would not.

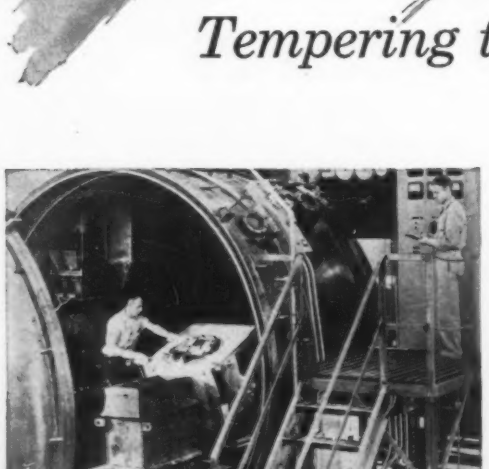
How it Happened—Both measures are designed to provide temporary relief from the effects of three U. S. Supreme Court decisions this spring, including the so-called Stockham Valve Co. case. The high court ruled that a state is free to tax a portion of the income of a firm earned within its borders on almost any "fair" basis it decides.

Because of a wide variety of tax formulas used by states, the same income may be subject to two or more taxes.

Probe to Follow—Both Senate and House measures aim to be followed by a complete congressional study of the problem. The House committee has created a special subcommittee which plans to hold hearings this fall on possible permanent solutions.



Tempering temperature's temper



Complete vacuum melting equipment is part of HAYNES STELLITE's modern plant facilities. For full details, write for 48-page descriptive booklet.

Heat of 2000+ deg. F. is generated in a supersonic jet's tailpipe. So is extreme vibration.

By far the best alloy tested for this critical component is MULTIMET alloy—one of 12 HAYNES alloys helping combat heat, stress, and erosion in the jet engine, missile, and rocket field.

HAYNES alloys are relied on for use in afterburners, turbine blades, nozzle vanes, and many other high-temperature parts. All 12 HAYNES high-temperature alloys are *production* alloys and are readily available. Some are vacuum melted. Some air melted. Some are cast, some wrought, some are produced in both forms.

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"Haynes," "Multimet," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Water Won't Worry Los Angeles

Reserves Assure Ample Supplies for the Future

Metalworking companies thinking about expanding in the Los Angeles area can forget about water problems.

There's enough available for double the present rate of consumption.—By R. R. Kay.

▪ Los Angeles is not about to dry up and blow away from lack of water. There's plenty for now and for the years ahead.

Despite rumors of severe shortages — and the reality of long droughts—there's enough water for double the present industrial and residential use.

Long Journey—That's the word from the city-owned Department of Water and Power. And it's important news for the hundreds of metalworking firms throughout the country who are thinking of setting up a plant there.

Los Angeles is a place of seasonal rainfall—and not too much at that. Most of its water comes from as far away as 300 miles to the north and east. Two giant aqueducts cross mountains and deserts to bring water from the lakes and streams of the Owens River region of the High Sierra and from the Colorado River.

Majority Via Aqueduct — Last year only 22 pct of the water sold by the Department came from local underground sources. The Owens River and the Colorado River aqueducts brought the major part, 78 pct. Daily average use, 414 million gallon, from the several sources breaks down this way: local, 93 million gallon; Owens River aqueduct, 287 million gallon; and Colorado River aqueduct, 34 million gallon.

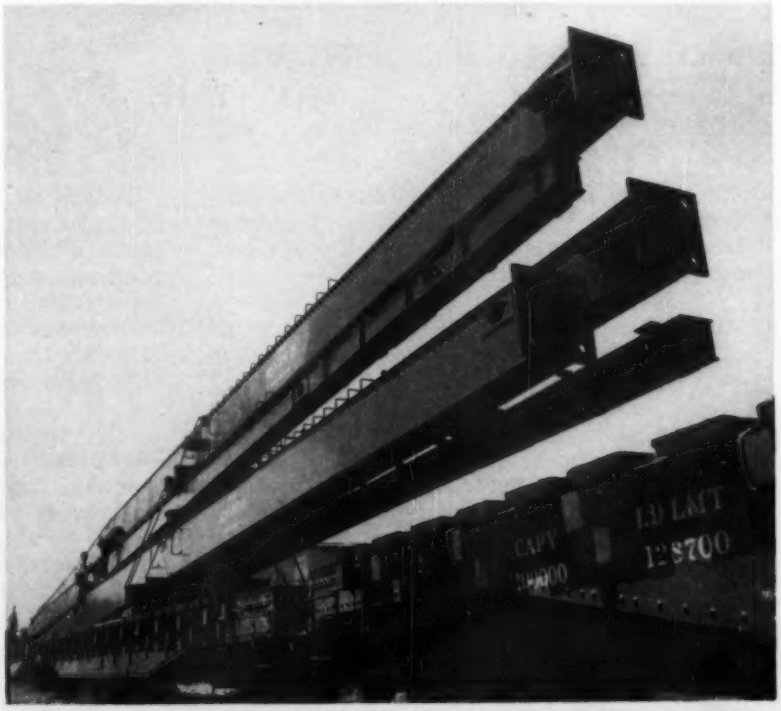
What about water for the future? The Colorado River water now used is actually only 8 pct of the 400 million gallon daily to which the Los Angeles Department of Water and Power is legally entitled. It operates under the Metropolitan Water District, a state agency.

Large Reserve—There is an unused reserve available to Los Angeles from the Colorado River alone of 366 million gallon daily. Last year the city used a total of 414-million gallon daily.

"Los Angeles is in a stronger position than any other southern California city with respect to future water supplies," reports J. C. Moller, Jr., president of the city's Board of Water and Power Commissioners.

"In addition, we have the prospect by 1972 of a third source of supply for southern California through the California State Feather River Project."

Five Tall Ones for Candlestick Park



LIGHT STANDARDS: Oversized steel towers, fabricated by Weld-Rite Co., Oakland, Calif., from Kaiser Steel plate, are readied for shipment to new Candlestick Point baseball field of the San Francisco Giants. Ten of the beams, each 196½ ft high, will be erected at the park.

This is a MARVEL High-Speed-Edge Hack Saw Blade Cutting a 4" x 4" Titanium Billet

EVERYTHING'S IMPROVED BUT THE GUARANTEE

33 years ago, MARVEL introduced the first welded-edge hack saw blades . . . guaranteed them to be shatterproof . . . and a new concept of power hack sawing came into existence.

In combining, by welding, two materials—a narrow, high speed steel cutting edge, and a tough alloy steel body, MARVEL pioneered the modern hack saw blade.

When operators learned they could apply the heaviest feed pressures and highest speeds to the new MARVEL Blades with complete confidence that they would never shatter or "explode" to cause them personal injury, hack sawing began the approach to its present high level of efficiency. Even cutting "exotic" metals, such as titanium, where heavier feed pressures are a necessity, the MARVEL Blade does an outstanding job and is completely safe.

Today's MARVEL High-Speed-Edge Hack Saw Blades are greatly improved, even over the MARVEL Blades which were the best on the market a few years ago. Advanced metallurgy has produced better steels; new heat treating and manufacturing techniques have brought further improvements. The only thing unchanged is the Guarantee: THEY ARE SHATTERPROOF!

If you haven't used MARVEL High-Speed-Edge Hack Saw Blades recently, try them on your saws for a month and see the difference a truly superior blade can mean in higher speeds, greater accuracy, lower cost per cut, and guaranteed safety to operating personnel. Your nearby MARVEL Distributor carries a complete stock of MARVEL High-Speed-Edge Blades.

Write for Bulletin CT-175 which has complete details on MARVEL High-Speed-Edge Hack Saw Blades.

ARMSTRONG-BLUM MFG. CO.
5700 W. BLOOMINGDALE AVE., CHICAGO 39, ILL.

MARVEL Metal Cutting SAWS
Better Machines–Better Blades

Machine Tools Hit the Road Up

It's a Long Pull, But Builders Are Optimistic

E. P. Bullard III tells his stockholders orders will continue to improve gradually.

Industry still has too much capacity to do any heavy buying.—By E. J. Egan, Jr.

▪ For most U. S. machine tool builders, the road back to the peak business levels of 1956-57 will be a long one. But the great majority of industry executives feel they are well on the way.

E. P. Bullard III, president and general manager of The Bullard Co., Bridgeport, Conn., expresses this typical view in his second-quarter report to stockholders. He notes a steady improvement in new orders for metal cutting machine tools and says he expects it to continue "at about the same gradual rate" in coming months, "barring a long steel strike."

Plenty of Machines—He foresees no sudden resumption of large-scale ordering, however, "as there is still excess productive capacity for most metal products."

Referring to industry-wide new orders for metal cutting machines in the second quarter up 25 pct over the first three months, and 81 pct above the 1958 quarterly average, he tells stockholders: "The Company's business has more than kept pace with this improvement. Second quarter . . . orders showed a 44 pct increase over the first quarter and were more than double the 1958 quarterly average."

Three Are Enough

Standard Cutting Oil—It's easy for a jobbing machine shop to become stocked with a wide variety of cutting oils for different machines and "special" jobs. Yet a big, diversified shop such as E. W. Bliss Co.'s Rolling Mill Div., in Salem, O., uses just three types of cutting oils for its broad range of work.

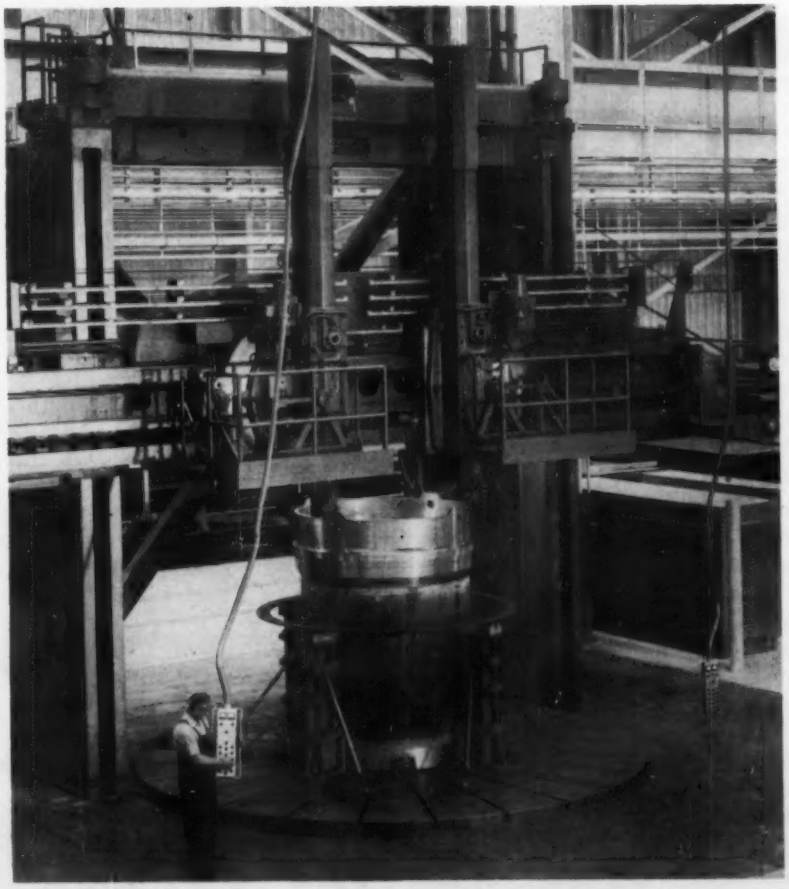
Three for All—The three oils, all produced by Gulf Oil Corp.:

A sulphurized mineral oil for precision gear hobbing and shaping.

A soluble oil for all work where cooling is a critical function, as on turret lathes.

A Sulphurized mineral-lard oil where close tolerances and superior surface finishes are essential, as in the machining of a 25-ft long screw which has two 29° Acme threads per in.

Ready for King-Size Jobs



BIG FUTURE: To meet growing demand for large processing vessels, A. O. Smith Corp. bought this giant Niles boring and turning mill.

INDUSTRIAL BRIEFS

More Aluminum Sheet — Fairmont Aluminum Co., subsidiary of Cerro de Pasco Corp., is launching a $10 million project to increase its annual capacity of finished aluminum coils and flat sheet products. Capacity will be increased to 66 million lb from the current 25 million lb. The company views this as only the first step in a long-term plan to up Fairmont capacity to 120 million lb. Planned equipment would be able to roll aluminum sheet to 60 in. wide.

Diesel Work Wins—The Franklin Institute, Philadelphia, will award its George R. Henderson Medal to the Electro-Motive Div. of General Motors for developing and mass producing the diesel-electric locomotive now widely used to haul both passengers and freight.

Business Will Boom—Production of ductile iron pipe will triple this year over 1958, and by 1961 will hit a 100,000-ton annual rate, says Donald J. Reese, director of the Ductile Iron Div., The International Nickel Co., Inc. Use of ductile iron for pipe in 1959 should be about 21,000 tons, he believes.

Automation in Flight — More than three years' work by the U. S. Army's Signal Research and Development Laboratories, Fort Monmouth, N. J.; and the Sperry Phoenix Co., a division of Sperry Rand Corp., went into development of aviations first universal flight control system. Basically, the system provides a set of electronic "building blocks" that can be installed in varying combinations to achieve any degree of automation in flight.

Ferroalloy Plant — Pittsburgh Metallurgical Co., Inc., plans to modernize its Niagara Falls, N. Y., ferroalloy plant, including new production equipment and a new power substation. The company has acquired the adjoining property for expansion.

Advice on Insulation—An Insulation Information Center to advise industry on selection and use of a wide range of insulation materials has been set up by the newly-formed National Insulation Mfg. Assn., 441 Lexington Ave., New York City. In charge of the service is John M. Barnhart, executive secretary; and Raymond C. Parlett, chairman of the technical and research committee.

Defense Transportation Medal—Robert G. LeTourneau, president of R. G. LeTourneau, Inc., Longview, Tex., maker of earthmoving equipment, will receive the tenth annual National Defense Transportation Assn. award. The award is made to the person "whose achievement contributed most to the effectiveness of the transportation industry in support of national security."

Big Contract—The Research and Advanced Development Div., Avco Corp., has been awarded a $73,360,000 contract by the Air Force to develop a re-entry vehicle (nose cone) for the Titan intercontinental ballistic missile.

Will Make Silicon — Inorganic Chemicals Div., Monsanto Chemical Co. will build a plant to make ultra-pure silicon metal for transistors and rectifiers. The plant will be near St. Louis, and Monsanto hopes it will be operating before the end of next year.

"He's taking tranquilizers."

Heavy Equipment on Time—Industrial buyers can now pay for a wide range of road building, construction, mining and logging equipment on the instalment plan from the Pettibone Mulliken Corp., Chicago. The newly-instituted program will be administered by James Talcott, Inc., one of the nation's oldest financing houses.

Reynolds Texas Expansion—Reynolds Metals Co. will expand its dock and loading facilities at its Sherwin Alumina Plant near Corpus Christi, Tex. Cost is estimated at more than $1 million. In addition to boosting capacity, and enlarging facilities to accommodate larger ships, Reynolds expects to add some ultra-new equipment.

Olin to McCormick — McCormick Steel Co., Houston, which claims to be the largest independent metals distributor in Texas, has been appointed to handle Olin Aluminum alloy, pig and ingot.

Will Seek Advice—Westinghouse Electric Corp. has formed a committee of three top scientists to counsel top management on matters pertaining to research. The committee: Dr. Cyril Stanley Smith, professor of metallurgy at the Institute for the Study of Metals, U. of Chicago; Dr. Julius A. Stratton, president, Massachusetts Institute of Technology; and Dr. J. C. Warner, president, Carnegie Institute of Technology.

Moving East—Lithium Corp. of America will move its St. Louis Park, Minn., manufacturing facilities and research labs to Bessemer City, N. C., where the company owns large ore reserves and operates a $7 million lithium chemical plant. LCA will also move its general offices to the East Coast.

Probe Tantalum—National Research Corp., Cambridge, Mass., has been awarded a contract by the U. S. Navy Bureau of Ordnance for research and development work on tantalum and tantalum-tungsten metal alloys for use as nozzles and other such parts in solid fuel rocket propulsion systems.

How Cyril Bath reduced friction, increased accuracy on this 50-ton radial draw former

THIS new Cyril Bath radial draw former produces contoured metal parts in sections up to 360° for industrial, aircraft and missile applications. Because the exacting work is done at low speeds, smooth starting and running are vitally important. And to *assure* smoother, more accurate operations, Cyril Bath Co. engineers switched to Timken® *tapered* roller bearings—22 in all—on the table, carriage and drives. Here's why:

1) *Timken bearings virtually eliminate friction.* They're geometrically designed and precision-manufactured to roll true. They reduce starting friction, roll smoothly and maintain their precision longer.

2) *Timken bearings have extra toughness* because their steel is nickel-rich.

Whether you build or buy machines, you get *extra* benefits with Timken bearings—benefits that come from the Timken Company's leadership in tapered roller bearing design and in engineering service. For example, we maintain the most modern bearing research center—use testing equipment you won't find anywhere else in the bearing industry. To be sure of getting top bearing value in your machines be sure they're Timken bearing-equipped. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

WHEN YOU BUY TIMKEN® BEARINGS YOU GET...

1. Quality you can take for granted **2.** Service you can't get anywhere else **3.** The best-known name in bearings **4.** The pace setter in lower bearing costs

BETTER-NESS rolls on

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tapered roller bearings

First in bearings for 60 years

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EIMCO CHALLENGES YOU TO COMPARE THE FACTS

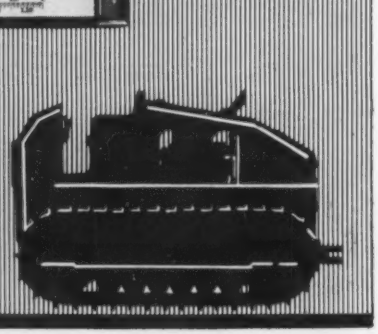
NOT THE CLAIMS

	EIMCO 103	CAT D-4	CAT D-6	AC HD-6	AC HD-11	INT. TD-9	INT. TD-15	CASE 1000
Maximum Drawbar Pull (zero track slippage)	33,000	10,700	19,000	15,485	21,980	13,240	23,750	24,000
Torque Converter	Yes	No	No	No	No	No	No	Yes
Master Clutch	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Power shift transmission on all speeds, with oil cooled metallic clutches that never need adjustment	Yes	No	No	No	No	No	No	No
Independently reversible track	Yes	No	No	No	No	No	No	Yes
Hydraulic track take-up	Yes	No	No	No	No	No	No	Yes
Heat-treated alloy steel grouser shoes, keyed to the track links	Yes	No	No	No	No	No	No	No
One-piece heat-treated alloy steel track rollers, tapered roller bearings	Yes	No	No	No	No	No	No	No
Equalizer bar of heavy duty heat-treated cast alloy steel, allowing full oscillation of crawler tracks with all attachments	Yes	No	No	No	No	No	No	No
Constantly running power take-off drives, front and rear, to standard SAE specs, with rear take-off not affected by track operation, and independent hydraulic pump drive allowing simultaneous use of hydraulic, winch and hoist accessories.	Yes	No	No	No	No	No	No	No
Front operator's seat for full visibility	Yes	No	No	No	No	No	No	No
Ability to operate forward and backward on up to 90% slopes	Yes	No	No	No	No	No	No	No
Tractor guaranteed for one full year of single shift service	Yes	No	No	No	No	No	No	No

for PROOF of EIMCO 103 SUPERIORITY

WEIGHT BARE TRACTOR, POUNDS	15,000	10,910	17,605	12,600	20,500	11,925	22,540	13,200
H.P. — FLYWHEEL	100	63	93	66	99	71	105	90
TRACK GAUGE, INCHES (STD.)	60	60	74	60	74	60	74	60
STD. TRACK SHOE WIDTH, INCHES	16	13	16	13	16	13	16	16
LENGTH OF TRACK ON GROUND, INCHES	88	61	85 3/8	66 7/8	85 3/8	73	89 5/16	79
TOTAL TRACK AREA, SQ. INCHES	2,820	1,589	2,744	1,739	2,744	1,896	2,858	2,528
GROUND PRESSURE, PSI.	5.3	6.9	6.4	7.3	7.5	6.3	7.9	5.2
TRACK ROLLER DIAMETER, INCHES	8	8	8	7 5/8	7 1/2	N.A.	10 1/2	6
TRACK RAIL WIDTH, INCHES	1 3/8	1 1/4	1 1/4	1 5/16	1 5/8	N.A.	N.A.	1 1/8
NUMBER TRACK ROLLERS, EACH SIDE	6	4	6	5	6	5	6	5
TRACK BOLT DIAMETER, INCHES	5/8	1/2	5/8	12/20	5/8	1/2	5/8	1/2
TRACK BUSHING DIAMETER, INCHES	2 7/32	2	2 1/8	2	2 5/8	2 1/16	2 1/4	1 27/32
TRACK PIN DIAMETER, INCHES	1 17/32	1 3/16	1 1/16	1 3/8	1 5/16	1 3/8	1 1/2	1 3/4
SPROCKET PITCH DIAMETER, INCHES	32 1/2	29 1/4	30 1/2	28 1/8	31 1/2	28 1/4	30 1/2	24 1/2
GROUND CLEARANCE, INCHES	17	11 1/2	12 1/2	11 1/4	12 1/2	10 1/8	11	16

N.A. — not available



Above is from manufacturer's data and other sources believed to be reliable, but cannot be guaranteed.

IT'S A FACT . . . not a claim . . . that here is a MODERN line of tractors that makes all other crawler-tractors old-fashioned!

Other exclusive features includes Unitized "Stress Flow" Construction, for far greater strength and rigidity; Self-cleaning Air Cleaner that completely eliminates ordinary routine cleaner maintenance and others, far too numerous to list here. Write for details and specifications on all the advanced engineering features of the modern Eimco 103 line of crawler tractors.

AVAILABLE IN FOLLOWING MODELS:

103 — TRACTOR AND DOZER
123 — FRONT END LOADER
133 — STEEL MILL FEL
143 — LOG LOADER

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

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TRACTOR LOADER DIVISION

634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

George W. Brown, elected president and chief executive officer, Wagner Electric Corp., St. Louis.

American Steel & Wire Div., U. S. Steel—**D. B. Carleton,** named works superintendent, New Haven works; **A. K. Zeitell,** works superintendent, Trenton works; **James H. Merrill,** division superintendent, wire mill, Worcester's South works.

Defense Products Div., Allis-Chalmers Manufacturing Co.—**R. R. Walker,** appointed sales manager; **H. H. McDaniel,** assistant sales manager; **Marvin Buege,** chief of contract administration; **H. B. McGreal,** project coordinator; **A. J. Bennett,** administrative assistant to sales manager; **G. R. Kennel,** supervisor of military vehicle sales; **J. A. Rainey,** sales supervisor for commercial vehicles.

Fuller Manufacturing Co.—**J. H. Burling,** elected secretary-treasurer, and also secretary of Shuler Axle Co., both subsidiaries of Eaton Manufacturing Co.

Jones & Laughlin Steel Corp.—**J. T. Bradford, Jr.,** appointed electrical control engineer.

American Machine Div. of United States Chemical Milling Corp.—**R. B. Williams,** named West Coast plant manager.

Bethlehem Steel Export Corp.—**W. P. Antrim,** appointed assistant to vice president.

Union Carbide Metals Co., Division of Union Carbide Corp.—**E. F. Helminiak,** manager of Chicago district; **Arthur Herbener,** manager of Cincinnati district; **F. A. Stephens,** manager, Detroit district.

Bethlehem Steel Co.—**W. B. Jameson,** appointed works manager, Torrence, Calif., fabricating works.

Reynolds Metals Co.—**G. A. Rutledge,** named chief packaging application engineer.

Ferro Corp.—**J. D. Campbell,** named manager of Supply Div.

Electrolytic Div., American Zinc Co., of Illinois—**R. K. Carpenter,** appointed superintendent of metallurgy.

International Epoxy Corp.—**Dr. R. E. Robinson,** elected president.

V. M. Holloway, appointed general sales manager, Construction Machinery Div., Allis-Chalmers Manufacturing Co.

Firth Sterling Inc.—**W. E. Montgomery,** named chief engineer, carbide division.

(Continued on P. 120)

John M. MacCrum, named vice president, sales, American Forge and Manufacturing Co.

Robert W. Dispennett, appointed manager, Pittsburgh district sales, Aluminum Company of America.

H. W. Gaeckle, named vice president and general manager Dracco Div. of Fuller Co., Cleveland.

TMI TUBING TIP:

Get Those Good Ideas "Out" of Storage

'Way up front on the administrative level or deep in the development stage, good ideas have no right to go into storage because of small tubing problems.

We've made it a TMI specialty to think them out of trouble and into successful production fast.

If it takes the most involved testing formula to accomplish our goal . . . we have it in full experienced operation: electronic, ultrasonic, X-ray, pressure, bend, tensile micro-visual and classified! One of them or all of them . . . always at your service at TMI.

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Serving a selected list of pioneering customers in aviation, nuclear energy, instrumentation and quality manufacturers in the metalworking industry. If your work is classified it stays that way *all ways* at TMI.

TUBE METHODS INC., Bridgeport, Montgomery County, Pennsylvania. Engineers, Metallurgists and Manufacturers Since 1941.

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Peter H. Fratangelo, appointed chief engineer, Mackintosh-Hemphill Div. of E. W. Bliss Co.

Ingersoll Kalamazoo Div. of Borg-Warner Corp.—**F. T. Cameron,** named manufacturing manager.

Industrial Heating Dept. of General Electric Co.—**W. B. Miller,** appointed manager of heaters and devices product section.

Pittsburgh Coke & Chemical Co. —**W. E. Lowe,** named assistant traffic manager.

The Oliver Corp.—**I. S. Boulton,** named director of purchases.

Industrial Truck Div. of Clark Equipment Co.—**P. E. Campbell,** appointed manager of transportation sales.

Robert N. Harwood, appointed manager, Cleveland Steel Service Center, J & L Warehouse Div.

H. W. Buchanan, named manager, general sales dept., Metal & Thermit Corp.

James B. Clow & Sons, Inc.—**G. W. Johnson,** named director of research.

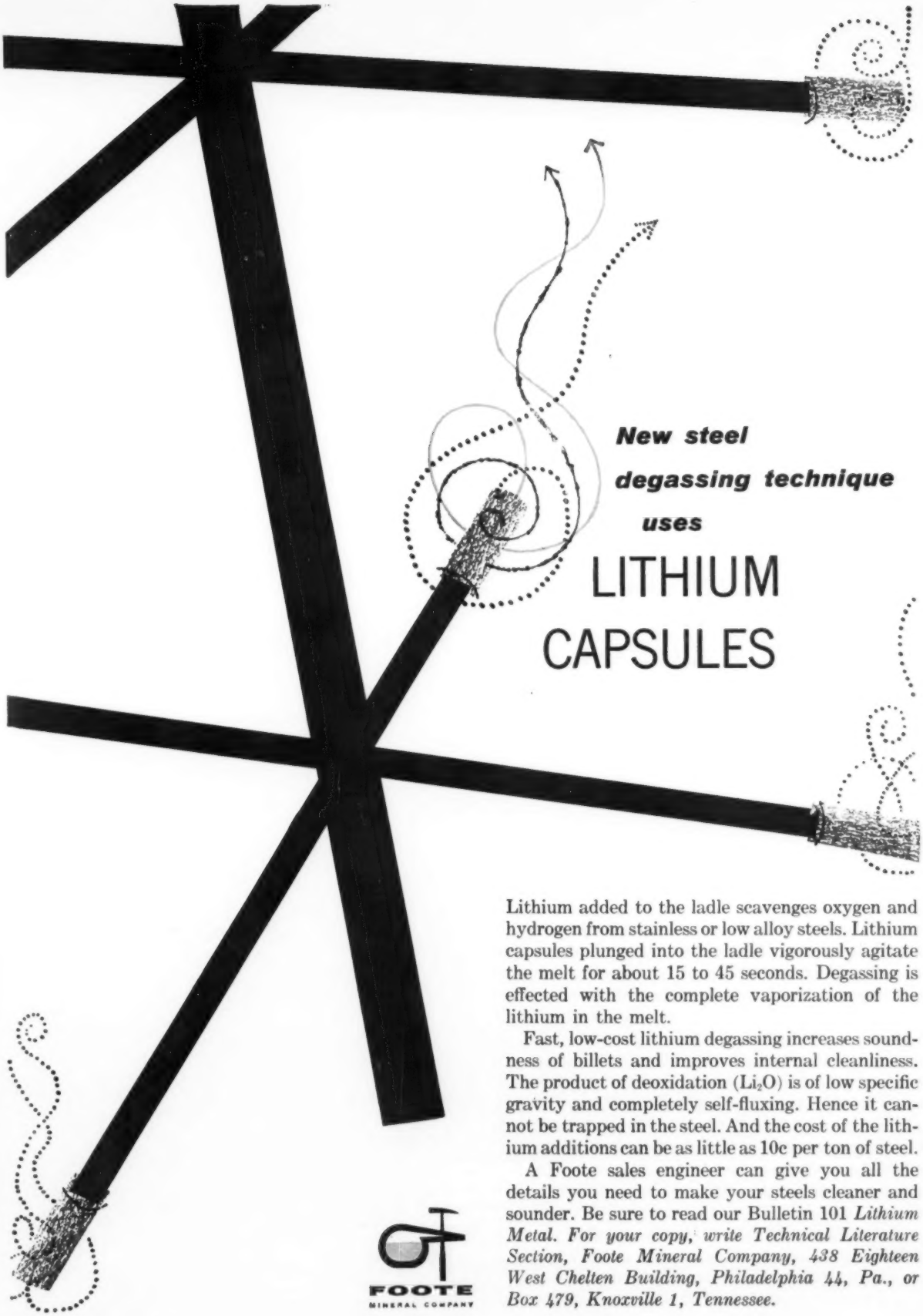
Hoover Ball and Bearing Co.—**R. W. Ebey,** appointed general manager of Ball Div.

The Oilgear Co.—**W. F. Gother,** named purchasing agent; **N. C. Harenburg,** appointed assistant purchasing agent.

Bendix Aviation Corp.—**L. B. Musser,** named Atlantic regional manager, Industrial Controls Section.

Rockbestos Wire & Cable Div., Cerro DePasco Corp.—**E. E. Barth,** elected treasurer.

N. W. Morelli, appointed works manager, Pittsburgh works, Allis-Chalmers Manufacturing Co.



New steel degassing technique uses

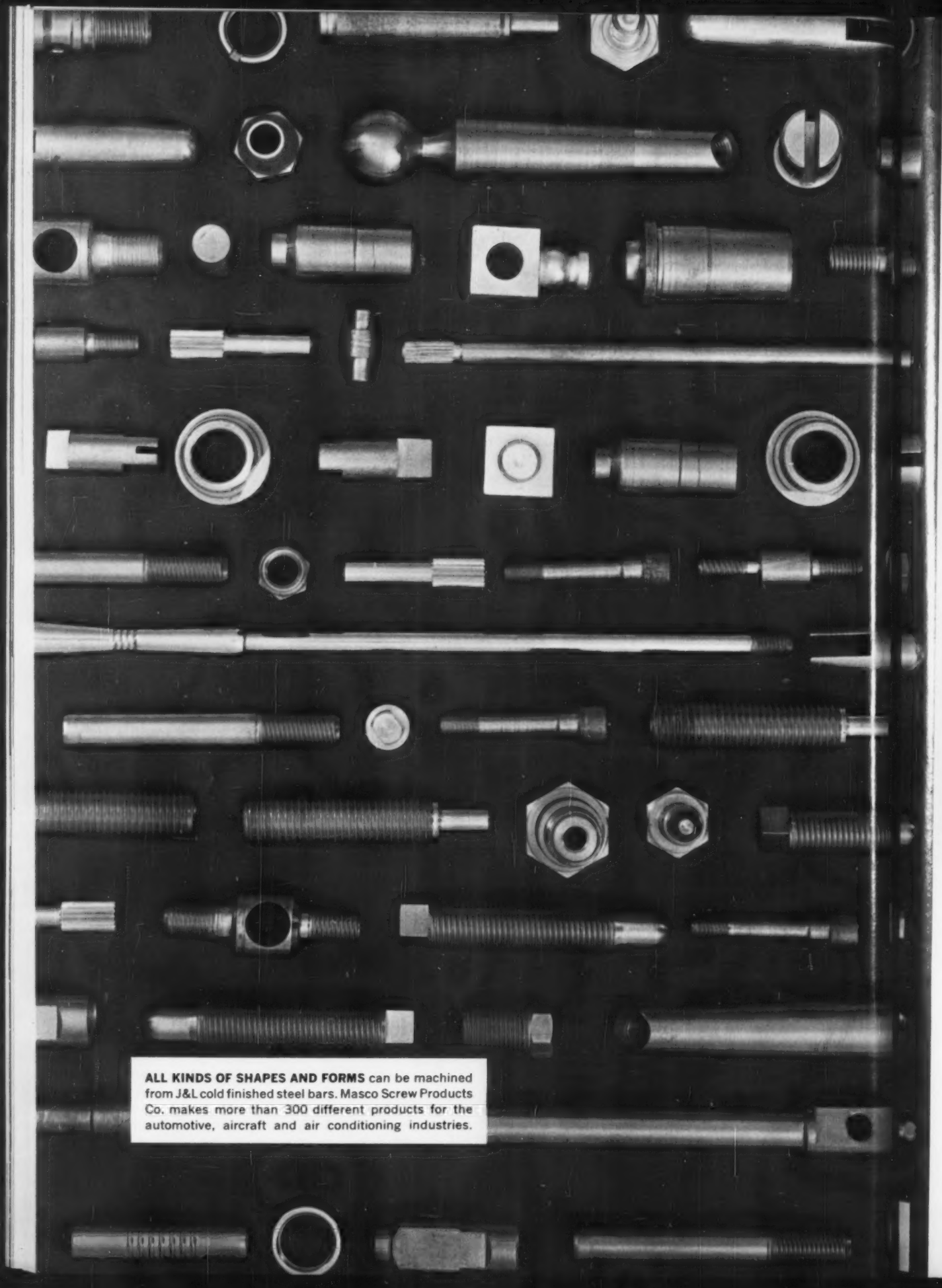
LITHIUM CAPSULES

Lithium added to the ladle scavenges oxygen and hydrogen from stainless or low alloy steels. Lithium capsules plunged into the ladle vigorously agitate the melt for about 15 to 45 seconds. Degassing is effected with the complete vaporization of the lithium in the melt.

Fast, low-cost lithium degassing increases soundness of billets and improves internal cleanliness. The product of deoxidation (Li_2O) is of low specific gravity and completely self-fluxing. Hence it cannot be trapped in the steel. And the cost of the lithium additions can be as little as 10c per ton of steel.

A Foote sales engineer can give you all the details you need to make your steels cleaner and sounder. Be sure to read our Bulletin 101 *Lithium Metal. For your copy, write Technical Literature Section, Foote Mineral Company, 438 Eighteen West Chelten Building, Philadelphia 44, Pa., or Box 479, Knoxville 1, Tennessee.*

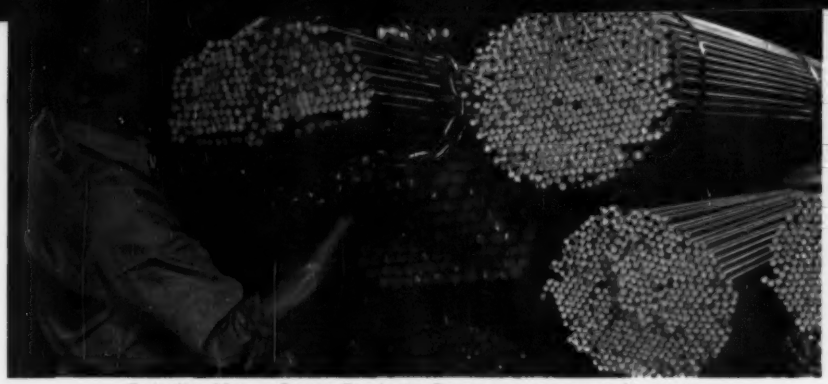
FOOTE
MINERAL COMPANY



ALL KINDS OF SHAPES AND FORMS can be machined from J&L cold finished steel bars. Masco Screw Products Co. makes more than 300 different products for the automotive, aircraft and air conditioning industries.

Prod
to m

Rigid
prod



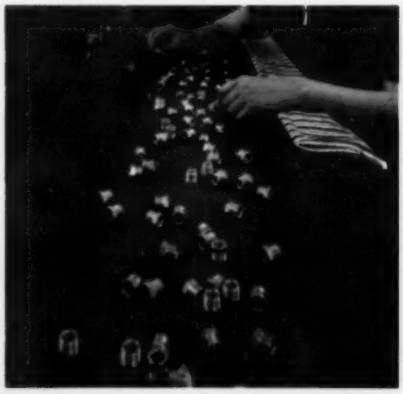
Detroit's Masco Screw Products Company uses round, square and hexagonal J&L leaded steel bars in sizes from ⅜" to 1⅛"

More than 96 automatic screw machines are in almost constant operation

Production runs vary from less than 10,000 to more than 2,500,000 pieces

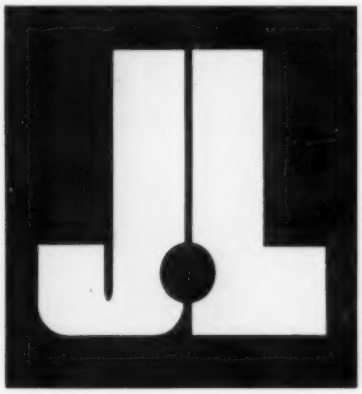
Even complex machining operations have fewer work stoppages with free machining J&L leaded steel

Parts are often so smooth after routine machining that no further finishing is necessary



Rigid Masco inspection procedures assure products of dependable quality

Masco regularly handles specifications calling for dichromate, chromium, and other protective coatings



"J&L leaded steel bars machine at maximum practicable speeds for screw machines"

. . . reports Masco Screw Products Company

"While we're seldom able to run our automatic screw machines at their maximum rated speeds, we've found that J&L leaded steel bars permit the fastest machining speeds practicable," says Alex Wood, plant engineer of Masco Screw Products Company, Detroit's largest independent manufacturer of screw machine products.

"The free machining properties of this J&L cold finished steel permit high speed production. The short length chips minimize tool edge build-up. Tool wear is reduced. And, frequently, fewer finishing operations are needed.

"This is a good steel for screw machine products."

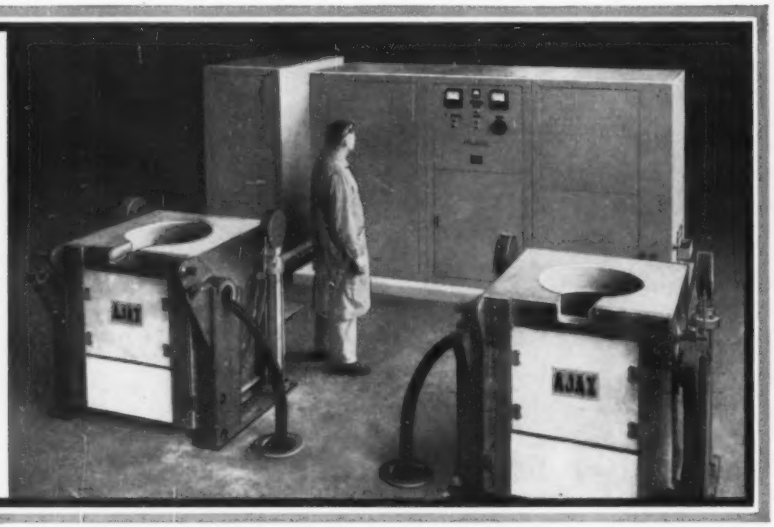
Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Where cold rolled steels originated in 1859

NOW INDUCTION MELTING COSTS LESS THAN EVER...

through
new
Multiductor*
power



*Trademark

* LESS INITIAL COST—The initial cost of a typical Multiductor is less than conventional motor generator type equipment. Further, because the unit is shipped completely assembled and wired, installation costs are drastically reduced. Multiductor requires minimum floor space and uses standard 3-phase, 60-cycle power from ordinary sources.

* LESS OPERATING COST—Operation is so nearly automatic that inexperienced hands quickly become expert operators. Output can be varied continuously . . . while under load . . . from zero to maximum with easy-to-use controls. Damage by overload is practically impossible.

* LESS MAINTENANCE—Multiductor is essentially a static frequency converter. It contains no rotating parts, nothing to wear out, and little to maintain. The number of heats per refractory lining has maintained an unusually high average, going as high as 400 heats with some alloys.

* LESS MATERIAL COST—The strong electromagnetic stirring action of Multiductor powered furnaces promotes rapid melting and diffusion of alloying elements with extremely low metal loss . . . is ideally suited for melting low cost scrap such as borings, turnings, and chips.

* SEE A DEMONSTRATION—Discover for yourself why more and more foundries—at least an additional one each week—are finding that Multiductor Powered Induction Furnaces are one of the greatest melting economizers in history . . . on small furnaces as well as 10-ton units. Write Ajax Electrothermic for a demonstration or an engineer's visit without obligation. Data bulletins are also available.

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How To Get More For Your Metalworking Dollar

Lubrication

IN THIS FEATURE

Every metalworking plant must spend a certain number of lubrication dollars each year to keep vital machinery running.

Some plants get full value for these dollars. The lubricants they buy are well suited to the various machines and mechanisms on which they're used.

In these plants production flows smoothly and efficiently; cases of unexpected and costly downtime due to lack of proper lubrication occur rarely, if ever.

Yet other plants—far too many of them —seem to be plagued with production stoppages. Bearings burn out, gears wear too rapidly, ways get gummed up. Why?

The answer isn't necessarily in the number of lubrication dollars a company spends. But it can usually be found in the way a company spends this money.

Hit-or-miss lubrication, even with the most expensive oils and greases, is almost certain to cripple your business. In terms of emergency maintenance, extra power requirements, poor-quality production, and safety hazards, the price is far too high.

In the long run, a program of planned lubrication is the only answer for any company that hopes to stay in business.

You Need a Planned Program

Of all the moves management can make to cut production costs, few will pay off as well as the installation of a planned lubrication program.

■ Regardless of the size of your plant, a system of planned lubrication for your machinery is the only way to get the most for your lubrication dollar.

What's more, such a system will be one of the best means in your entire business operation for both saving money and making bigger profits at the same time.

First of all, though, the term "planned lubrication" needs to be defined.

What it Isn't — Most emphatically, the definition is not found in the reaction of one executive who was asked if his plant lubrication went according to a plan. "Sure," he replied, "we put oil and grease in the machines every once in awhile, same as we sweep the shop floor every so often. Matter of fact, the same man does both jobs."

On the contrary, planned lubrication is anything but an "every-once-in-awhile" proposition. Nor is it a task to be assigned casually to your plant sweepers.

What it Is—Planned lubrication is a critical function aimed at reducing frictional wear to maintain top accuracy and productivity in costly machines. If you're not convinced it's worthwhile, tot up the replacement value of your equipment. Then ponder the remark of an anonymous but wise individual who once said: "There's probably about one sixty-fourth of an inch between a new machine and the junk pile."

With planned lubrication, your machines may never wear this critical amount. Without it — well, equipment can cover this distance in an unbelievably short time and

TIME TO CHANGE: Portable pumps for draining and refilling machine reservoirs at recommended times are handy tools for your planned program.

Sun Oil Co. photo

cause you plenty of added grief along the way.

There's nothing especially difficult about setting up a system of planned lubrication. It's a matter—as you may have heard before—of getting the right quantity of the right lubricant to the right place at the right time.

A Fifth "Right"—You can even amend this definition by adding in the "right price," because you'll most likely wind up buying fewer types of lubricants and getting more service from those you do buy.

These savings in lubricant costs, however, will be only a small fraction of the savings you can garner in other areas with a well organized lubrication program.

The biggest gains, of course, will come in the reduction of equipment maintenance costs. Such costs include not only the high prices you pay these days for labor, materials and replacement parts. There's also the item of interest on machine investments, plus other overhead expenses which go on all the time, whether the equipment is running or not.

Include Lost Earnings—You expect, for example, that a certain machine will earn so much per hour. It can't when it's not running, so the cost of this lost production time is really a part of your maintenance cost.

Machines that are out of production can be expensive in other ways, too. The cost of delayed deliveries or lost customers can be incalculable, very often far beyond the small initial expense you might incur in setting up a planned lubrication program.

Here's something else to think about. One machine going down for lack of proper lubrication might not be too alarming by itself. But if it's an integral part of a production line, as is so often the case in this automation era, then a whole string of equipment is forced out of commission. Making up these losses is always expensive and sometimes impossible.

With Planned Lubrication You Will . . .

- **Reduce machine downtime**
- **Need fewer replacement parts**
- **Increase production**
- **Improve product quality**
- **Reduce safety hazards**
- **Cut scrap losses**
- **Use less electric power**
- **Use fewer lubricant types**
- **Buy lubricants in bulk**
- **Extend equipment life**
- **Get longer lubricant life**

Brings Safety Benefits—Planned lubrication programs save in other ways, too. For example, they have often been instrumental in improving safe working conditions and cutting accident rates. When the correct lubricants are applied to machines in the proper amounts at the proper times, there is much less chance for a machine malfunction to cause an accident.

Proper lubrication avoids spillage, also, and there's no question that the record of slippery-floor accidents and claims paid would fill many volumes.

Safety benefits apply to fire hazards, as well. It goes without saying that a planned program for orderly storage and efficient handling of lubricants will do much to minimize this danger.

Safe workers and safe, accurate equipment point up still another cost-reduction benefit of planned lubrication programs. This is the amount of savings that can be converted into profits when men and machines team up to produce better quality work.

Cuts Reject Losses—The result is fewer parts that need expensive rework and, possibly more important, fewer-out-and-out rejects that represent virtually a total loss in time and materials. Correct lubrication is a big factor in upgrading product quality.

It follows that planned lubrication will often let you run equipment at higher speeds and greater load capacities than it was originally built to handle.

One example is a 30-year old paper-coating machine that is currently producing at twice the load and three times the speed it was originally designed for. Modest changes in bearing design and the lubrication system of the equipment

did this for a cost of about $8000. To replace this machine at current prices would cost about $205,000.

Saves on Power—Power costs often decrease, also, as equipment receives more adequate lubrication. This was pointed up in the case of a manufacturer who faced the problem of speeding up some equipment-drive mechanisms. He assumed that a capital investment of $75,000 for new drives was inevitable inasmuch as the existing drives already seemed to be overloaded.

Fortunately a lubrication engineer came along to suggest redesigning the sleeve bearings of the existing drives and making a change in the oiling system. Total cost of these changes came to only $9000.

The alterations not only enabled the old drives to keep up with the new speed and load demands, but reduced the power consumption cost $6000 per year in the bargain. Still, if these changes had been made years before, the manufacturer would have saved an estimated $120,000 in electric power costs over that period.

Profits from Planned Lubrication

Case No. 1: Heavy-Machinery Builder

Cost Factors	Before Planned Program	After Planned Program
Annual Productive Manhours	4,302,954	4,169,115
Annual Maintenance Cost	$223,073	$159,709
Maintenance Cost per Production Manhours	$0.0518	$0.0303
Pct Decrease		26.06

Case No. 2: Mass Producer of Small Stampings

Cost Factors	Before Planned Program	After Planned Program
No. Different Lubricants Used	126	22
Annual Lubricant Cost	$16,184	$8834
Pct Decrease in Lubricant Cost		45.5
Annual Maintenance Cost	$940,080	$787,215
Pct Decrease in Maintenance Cost		16.3

The moral is: Never assume your power costs are all right just because your equipment is running.

Another Moral — Actually, for your management task of getting the most for your lubrication dollar, this paraphrase of the preceding moral is an even better guide: Never assume your profits are all right just because your equipment is running with some sort of lubrication.

It's certainly true that despite the great lack of planned lubrication programs in industry, most plants manage to plug along somehow. Machines do get lubricated after a fashion. The worker whose wages depend on his production from a particular machine will usually dump in some sort of lubricant to keep it running.

Easy to Be Wrong—But consider the hazard inherent in loose practices which can, unwittingly, be just the opposite of a planned lubrication program. The wrong quantity of the wrong lubricant applied to the wrong place at the wrong time can be disastrous.

At the very least, these "wrongs" cost the metalworking industry millions of dollars in unrealized profits every year.

How, then, do you—small and large plant, alike—go about installing a planned lubrication program? What, specifically, is involved in the pleasant-sounding but generalized concept of the right quantity . . . right lubricant . . . right place . . . right time . . . right price?

First of all, a successful planned program is never organized and sold from the bottom up. Management must believe in the benefits to be gained and act with enthusiasm, understanding and patience to sell the program from the top down.

One-Man Job—This emphasis on management attitude doesn't mean you should apply the committee approach, however. Far from it; the responsibility for planning and maintaining an organized, plantwide lubrication program is basically a one-man job, and a job for a special kind of man at that.

ROVING CLASSROOM: Mobile training unit contains working components of modern centralized lubricating systems. It's used by U. S. Steel's lubrication engineers for demonstrating maintenance techniques.

■ How to Get More for Your Lubrication Dollar | **Part 2**

Meet the Lubrication Engineer

No plant is so small that it can't put one man in full charge of its planned lubrication program. The job is a big one, and it calls for specialized knowledge.

■ No one would expect the top management group in any metalworking plant to know all about modern lubrication technology.

However, the management team can and should realize that planned lubrication programs are tools for cutting costs and increasing profits, and that it takes specialists to apply these tools to the best advantage.

Valuable Outside Help — Such specialists are trained lubrication engineers. Major producers of lubricants and lubrication devices employ hundreds of these professionals in key sales and service positions. Their job is to help you in as many ways and as often as they can.

Such help can be invaluable, for example, in setting up your planned lubrication program. But it can't, of course, be exclusively yours on a full-time basis.

Yet you need to keep up with every development in lubrication technology that might benefit your equipment, your production, and your profits. Someone in your organization must take the responsibility for keeping your planned lubrication program at peak efficiency.

Your Own Specialist—This is a big and important responsibility. It's already been mentioned that it takes a special kind of man. Hundreds of manufacturing companies employ their own trained lubrication engineers to direct planned programs full time. If your annual budget for production maintenance is $100,000 or more, you can probably profit by having one of these specialists on your payroll.

Companies with smaller budgets often assign a capable maintenance foreman to the job. In any case, the important thing is to have one

man in full charge. The man you choose should have:

1. A thorough knowledge of lubricant theory.
2. Full knowledge of lubricant types, compositions, and characteristics.
3. An understanding of the working principles of all types of lubricating devices and equipment.
4. A knowledge of machine design, including all components, materials of construction, finishes and clearances.
5. A personality that will make it easy for him to apply his knowledge, exercise his authority, and still win the close cooperation that a plant-wide program must have to succeed.
6. The imagination to see the full scope of his job, plus the drive to carry it through.
7. The ability to translate program gains into dollars and cents.

Many Duties—Now look at some of the plant lubrication engineer's duties and responsibilities, as listed in the adjoining box.

The lubrication survey at the top of this job list is critically important. It establishes the base on which your entire program of planned lubrication will stand.

Your lubricant supplier can give you a big assist in making a survey, which is literally an inventory of every piece of plant equipment that requires lubrication.

Complete Record — Each machine must be recorded by name, type, serial number, or other identifying features. Every part of the machine which requires lubrication must also be cataloged, together with the locations of all points where lubricants are to be applied.

The survey record will also note the types of lubricants the machine builder recommends for these key points, and the recommended frequency of application.

Your actual lubrication practices may have strayed from these recommended patterns, however. If so, the lubrication engineer will note these variations after talking to machine operators, maintenance men, or whoever was responsible prior to the planned-program idea.

Armed with detailed information on your plant equipment and past lubrication practices, your lubrication engineer is ready to carry out the rest of his duties. Lubricant selection; a system of storing, handling, and dispensing oils and grease; a sound program of applying the right amount of the right lubricant at the right time and place —these are the areas where your savings will start to add up.

A Planned Lubrication Program

Your Lubrication Engineer Will Build it By:

1. Surveying every machine in the plant.

2. Specifying the minimum number of lubricant types that will adequately serve all equipment items.

3. Preparing lubrication charts and cards for each machine indicating the type of lubricant to be applied at each point, also the frequency and method of application.

4. Marking all machine-lubrication points in a way that insures application of the right lubricant.

5. Planning routes and schedules for lubrication service men.

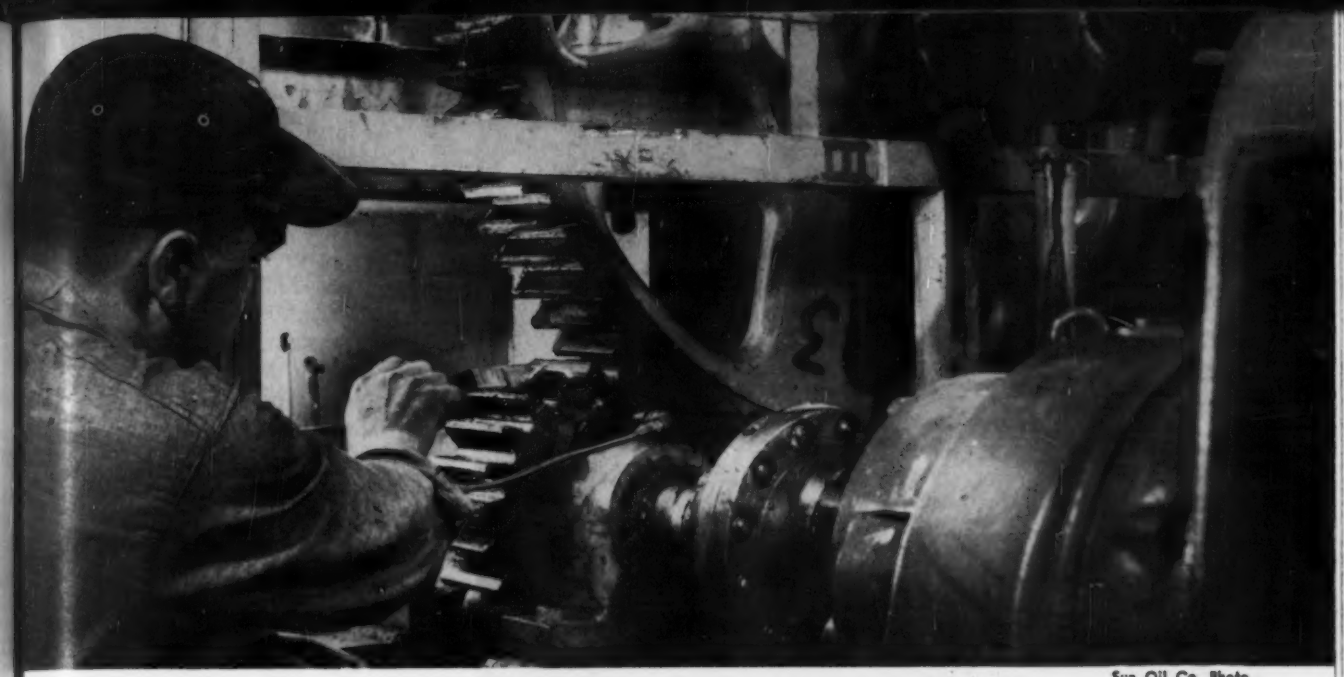
6. Setting up efficient, economical facilities and methods for storing, handling and dispensing lubricants.

7. Keeping records to check on the efficiency of the program, and to note program savings as they become evident.

8. Training plant personnel in the theory and practice of planned lubrication.

9. Standardizing lubrication devices and fittings on plant equipment, and checking to insure that newly-purchased equipment is designed in line with these standards.

10. Setting up a program to analyze and test new lubricants as well as those in regular service.



Sun Oil Co. Photo

BIG PROBLEM: With motors, journals, and open gears all in need of lubrication, the job is to select the fewest number of the right types. You can buy performance-warranted brands for such uses.

■ How to Get More for Your Lubrication Dollar | **Part 3**

Buy Fewer, Better Lubricants

You can't run your plant with one universal lubricant. Nor should you buy every type recommended. Here's how to strike the right balance between economy and suitability.

■ Two extreme and opposite points of view bracket the problem of selecting the right lubricant for your planned program.

One says, "Oil is oil and grease is grease, so buy them as cheaply as you can—that's all there is to it."

The other insists there is a special lubricant for every purpose and that every one of the types and grades recommended by the manufacturers of your plant equipment must be bought, stocked and used.

Seek Middle Ground—Actually, the point of most efficient and economical lubricant selection lies somewhere between these two extreme arguments.

No responsible lubricant supplier would be content to go along with the "oil-is-oil" concept. In selling you a cheap product for universal use in your machinery, he would quickly and effectively sabotage your plant. By so doing, he would suffer irreparable harm to his own reputation.

Nor, on the other hand, would the same supplier willingly load you up with every type and grade of lubricant in the book. Mixups in the use of these products would inevitably occur. This could also put your machines out of whack in short order. But even if you kept these products straight, you'd soon learn that slavish adherence to maintenance-manual recommendations is a costly luxury.

Extreme Conditions—Such recommendations are usually based on two factors: (1) the most severe operating conditions a machine might encounter, and (2) the most inadequate maintenance program that could be imagined in a user's plant, meaning virtually none at all.

For example, a machine builder might suggest an oil change for the hydraulic system every 1000 hours of operation, and a filter change at the same time. However, if your planned program provides for using a proper lubricant and keeping dirt out of the system, you can generally run 30,000 hours or more without a change.

Don't think the machinery builders are giving you wrong advice, though. It's simply a case where they know and state what is best for their equipment. It's not feasible for them to juggle their recom-

Sun Oil Co. Photo

WHAT TO SPECIFY: Where mass production is important, lubricant-selection standards might well be based on brands that cut downtime.

mendations to tie in with your lubrication program or with the other types of machinery you operate.

It's Your Decision—So it's up to the specialist in charge of your lubrication program to make plant-wide sense out of a collection of single-machine recommendations. It's his job to sort out, simplify, and standardize on the fewest possible types and grades of lubricants that will suit all of your equipment and your particular operating conditions.

The Texas Company calls this a process of "consolidation," and says it should keynote any lubricant-selection program, "regardless of whether lubricants are selected by brand name, specification, or some other means." Moreover, it says you should always consolidate in favor of quality products.

How Upgrading Works—As an example, the company points to a case "where a premium type oil containing rust and oxidation inhibitors is required for machines being lubricated by a central circulating system, and a straight mineral oil of the same viscosity is being used for machines being lubricated by oil cups.

"By using the premium product for both applications, the basic lubrication requirements for all of the machines involved would still be fulfilled, the number of lubricants would be reduced by one, and the chance of the straight mineral oil being used where the premium quality product was required would be eliminated."

Actually Saves Money — The company admits this would increase lubricant costs for the machines serviced by oil cups, but says this increase would be more than overbalanced by stock-reduction savings.

When a real effort is made at consolidation, Texaco engineers say the number of lubricants used can usually be reduced at least 50 pct and frequently more.

The man in charge of your planned lubrication program will make this "real effort" if you give him ample authority and your enthusiastic support.

Long Process—He'll start by referring to his lubrication-survey record of each machine, and by checking out certain points regarding the operating conditions for each machine.

He'll study the loads, speeds, and temperatures at which your machines operate. He'll note whether they run continuously or intermittently, and whether lubricants are to be retained or passed through certain elements of the equipment.

In making this study, he'll also observe whether seals and fits are tight enough to retain a high-quality lubricant, or whether the makeup problem is apt to be so

On Any Machine . . .

You Use Lubricants to:	You Use Lubricants on:
1. Reduce friction and wear	1. Plain and anti-friction bearings
2. Dissipate heat	2. Sliding surfaces
3. Keep out dirt	3. Gears
4. Prevent rust	4. Pistons

great that a lower quality product is the best bet.

Types Become Clear — Gradually, after a process of checking and cross-checking, he'll have a good idea of the types of lubricants you'll need for your planned program.

The question of how to buy these lubricants leads to one of the most hotly debated topics in the supplier-user relationship: Should the user buy according to his own chemical or physical specifications, or according to brand names which are performance-warranted by the supplier?

Let's see just what these chemical and physical specifications involve.

Not Too Practical—A straight chemical specification prescribes the source of crude oil, the refining method, and the additives contained in the final product. In general, lubricant suppliers feel that such specifications limit product quality at a particular point. Actually, the practice is not widely used.

On the other hand, physical specifications are widely used in buying lubricants. They pinpoint certain properties to be determined by standard test procedures, generally the same tests the supplier uses for his manufacturing-control setup.

Typical tests for gravity, flash, fire, viscosity, viscosity index, color and pour point do serve to identify the lubricant. But they have no relation to its quality, says Mr. Bruce M. Dunham, technical consultant for Sun Oil Co.'s industrial products department. "In no way do they foretell how a given lubricant will perform in service," he says.

Performance is Key—"The great majority of purchasers are interested," Mr. Dunham believes, "in making certain that the lubricants they buy perform satisfactorily . . . and that the supplier does not vary the quality or characteristics of his products.

"This being the purpose," Mr. Dunham adds, "the purchaser may do one of several things:

"(1) He can purchase from a supplier who warrants uniformity and then trust that warranty.

"(2) He can ask the supplier for the control tests the supplier uses

Which Specifications Are Important to You?

■ Important Significance ■ Secondary Significance □ Little or No Significance

Lubrication Specifications	Flash Point	Fire Point	Viscosity	Viscosity Index	Pour Point	Carbon Residue	Anti-Rust	Anti-Corrosion	Oxidation Stability	Demulsibility	Extreme Pressure	Detergency	Saponification No.	Anti-Foam
APPLICATIONS														
Turbines	□	□	■	□	□	□	■	■	■	■	□	□	□	■
General Lubrication	□	□	■	□	■	□	□	□	□	□	□	□	□	□
Hydraulics	□	□	■	■	■	□	■	■	■	■	□	□	□	■
Circulating Systems	□	□	■	■	■	□	■	■	■	■	□	□	□	■
Worm Gears	□	□	■	□	■	□	■	■	■	□	■	□	■	■
Hypoid Gears	□	□	■	□	■	□	■	■	■	□	■	□	□	■
Other Gears	□	□	■	□	■	□	■	■	■	□	□	□	□	■
Machine Tool Spindles	□	□	■	□	□	□	■	■	■	■	□	□	□	■
Ways	□	□	■	□	□	□	■	■	□	□	■	□	□	□
Electric Motors	□	□	■	□	■	□	■	■	■	■	□	□	□	■
Internal Combust. Engines	■	■	■	■	■	■	■	■	■	□	□	■	□	■
Steam Engines and Pumps	□	□	■	□	■	□	□	■	□	□	□	□	■	□
Air Compressors	■	■	■	□	■	■	■	■	■	□	□	□	□	□

in his own refinery to maintain uniformity, and duplicate them in his own laboratory on samples from each delivery. This method is practical provided the test methods used are standard and reproducible, and conducted by a laboratory staff experienced in interpretation.

"(3) He can establish his own tests and demand that suppliers meet them. This, to be at all practicable, necessitates the supplier establishing these tests as part of his control and is no different in effect than the procedure (2) just cited. This procedure does have the marked disadvantage of limiting quality and number of suppliers."

Use "Physicals" With Care—Mr. Dunham feels that physical specifications are reasonable "as long as the purchaser uses them only to check the uniformity of a product already approved." As he points out, two lubricants may fall within the same physical test limits but still perform quite differently in actual service.

Thus the way a lubricant actually performs in your plant is the best test, in Mr. Dunham's view. His opinion is shared by most lubrication engineers, and the authoritative Lubrication Committee of the American Petroleum Institute.

Some years ago the API committee took a long look at this question of chemical and physical specifications vs. performance data as a basis for buying lubricants. Its conclusions were summed up in the title of its report: "Buy on Performance."

Gaging Performance — How do you make sure the lubricant will perform in a manner that's most beneficial to you? Laboratory procedures won't help you too much.

Although suppliers have made great progress in the functional testing of lubricants in their own laboratories, such tests are necessarily run under closely controlled conditions. As yet, they cannot tell exactly how lubricants will work out for the wide variety of variable operating conditions in your plant.

The API committee report suggests you tackle the job of performance evaluation this way:

"With his own or the oil companies' engineers, the purchaser determines desired standards of performance for his particular equipment and operating conditions, and then requires suppliers to meet these standards with brands whose quality, suitability and uniformity are warranted. Such a purchaser relies on the oil companies' research laboratories for the development of manufacturing skill and engineering test procedures."

Try These Approaches—The report says you can determine performance standards by analyzing such factors as: (1) The effect a lubricant has on production volume or quality. In many plants, the report points out, lubricant quality can be directly measured by the quantity or quality of products turned out.

(2) The effect of a lubricant on maintenance costs. The oil or grease that gives you the longest bearing or gear life automatically gives you a performance standard for purchasing.

(3) The effect of a lubricant on power requirements. In certain industries—textile spinning, for example—friction in thousands of bearings is the major item in power consumption. In such plants, the chief performance standard of a lubricant may well be its ability to reduce friction.

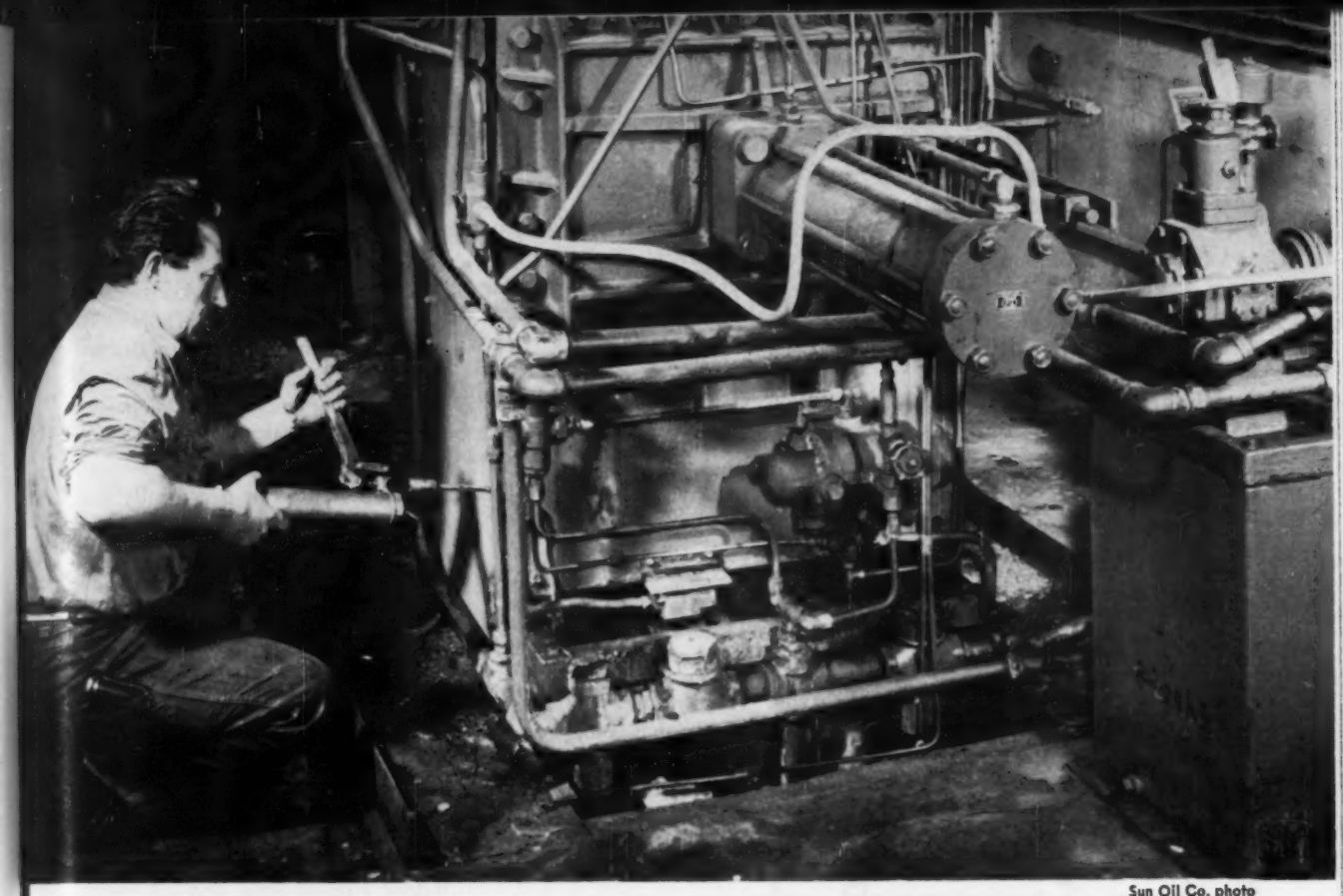
(4) The effect of a lubricant on the overall cost of lubrication. Here your performance standard may well disregard a few cents per gallon difference in lubricant cost—if the more expensive product gives you production economy, longer lubricant life, and worthwhile savings in machine-maintenance and power consumption.

Another Way — You may not have to test lubricants in every machine in your plant to determine the performance standards that best suit your operations, however.

Instead, you can often buy "job-proved" lubricants from reliable suppliers. These are products with proven performance ability under service conditions similar to those in your plant. The supplier will guarantee such products in every way. "In most instances," Mr. Dunham points out, "this is the most sensible method of buying."

Study Each Machine Carefully

- **Are the moving parts designed for oil or grease?**
- **Will it run at a slow speed and heavy load, fast speed and light load, or some intermediate combination of speed and load?**
- **Are the bearings plain or anti-friction types?**
- **Will the bearings and gears operate under extreme pressure conditions?**
- **What will be the operating temperature of the machine?**
- **How is the lubricant to be applied?**
- **Is there any possibility of lubricant contamination?**
- **Will the lubricant stay in the machine, or is it to be of the once-through type?**



Sun Oil Co. photo

WHERE IT COUNTS: In goes, say, an ounce of grease. The only question is: Will it be the proverbial "ounce of prevention" against a bearing failure? Chances are it will be if the grease is kept clean.

■ How to Get More for Your Lubrication Dollar | **Part 4**

Keep Your Lubricants Clean

Proper handling, storage, and dispensing of lubricants are important phases of your planned program. The essentials are few, the benefits many.

▪ Modern industrial lubricants, delivered to your plant in drums and pails, are as contaminant-free as it is posssible to make them. It is your job to see that they stay clean and free from any deterioration from the time you receive them until they are applied to your machinery.

The reasons for this extreme cleanliness are simple—but very important. Dirt and grit play havoc with the bearings, gears and hydraulic systems of modern, high speed machines. And where additive-type lubricants are compounded to a delicate formula balance, upsetting this balance in any way can be equally disastrous.

Three-Part Program — Your responsibility for seeing that only clean - as - manufactured lubricant goes into your equipment involves three separate phases. One applies to the handling of lubricants at the time you receive them. The second covers lubricant storage. The third applies to the dispensing of these products at scheduled times as part of your planned program.

As you receive them by train or truck, lubricant drums and pails are sturdy, well sealed, and properly labeled. However, these containers are not indestructible. They're fairly heavy, too (a full 55-gal oil drum weighs over 400 lbs), which is another reason you should handle them carefully.

Don't Drop Drums — Unloading drums by dropping them on old truck tire casings is, unfortunately, a fairly common practice. If it's

been your practice in the past, the man in charge of your planned program should stop it right away. It's dangerous for your workers, bad for once-tight drum seams and covers, and risky from a fire-hazard standpoint if any lubricants get spilled.

If you have an unloading platform that's level with the beds of freight cars or trucks, use it by all means. If you don't have a platform, you can buy inexpensive steel-rail skids for sliding drums end-first to the ground. Skids are a standard 16-in. width and come in lengths ranging from 6 to 12 ft.

In some cases, your delivery truck may have a hydraulic lift gate to simplify your unloading problem.

Transport Tricks — There are several ways to move drums from the unloading point to whatever storage area you plan to use. For short hauls and modest quantities, the conventional hand truck, with an adjustable hoop to drop over the top of a drum, is a handy item.

For longer distances, various forms of lift trucks, or parallel sections of metal track, are more practical. They place less strain on drum seams.

If possible, avoid storing your lubricants outdoors. Exposure to the elements invites contamination and deterioration from water, rust, and dirt. At the very least, painted identification labels might fade or wash away, and it's expensive to reidentify these "surprise packages" with lab tests. It's even more expensive to guess wrong about the contents and misapply them to your equipment.

Avoid Temperature Extremes—Outdoor storage has other drawbacks, too. Temperature extremes can damage lubricants; low temperatures can actually make some soluble oils and compounded products useless. Certain temperature-damaged products can be salvaged, however. If you suspect any such condition, check with your lubricant supplier.

If you must store lubricants outdoors, provide some sort of shed or shelter. But don't store drums upright; place them on their sides on planks or racks, and keep the bungs horizontal so they can't "breathe."

Inside storage in a centrally located area is the best way to protect containers and their contents from damage. It may involve two problems, however. One concerns finding the necessary storage space for unopened drums and pails. The other: finding or making space for opened containers and the equipment required for dispensing lubricants. This area will be your "oil house" or "oil room."

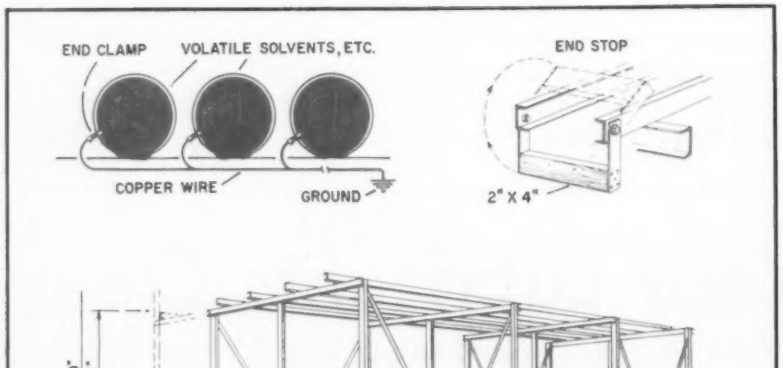
Fireproof these Areas—Both the indoor storage area and oil room area should be fire-proof. Brick, tile or concrete floors and walls are a must, as are suitable drains. Construction details should conform to those outlined in the National Safety Council's "Safe Practices" bulletin.

Indoor storage and oil rooms should be cleaned on a regular schedule. It pays dividends, too, to keep different types and brands of lubricants stored in an orderly manner. Do not store drying oils, such as linseed oil, in the same areas where you keep lubricants. The risk of a mixup in products is too great.

The oil room, in particular, should be located to avoid the possibility of opened containers being contaminated by dust, fly ash, lint, chemical fumes, or other byproducts of your manufacturing operations.

Room for Equipment—Oil room space depends only partially on the quantity of lubricants you want to store and handle. You must also provide room for oil wagons, dispensing cans, grease guns and fit-

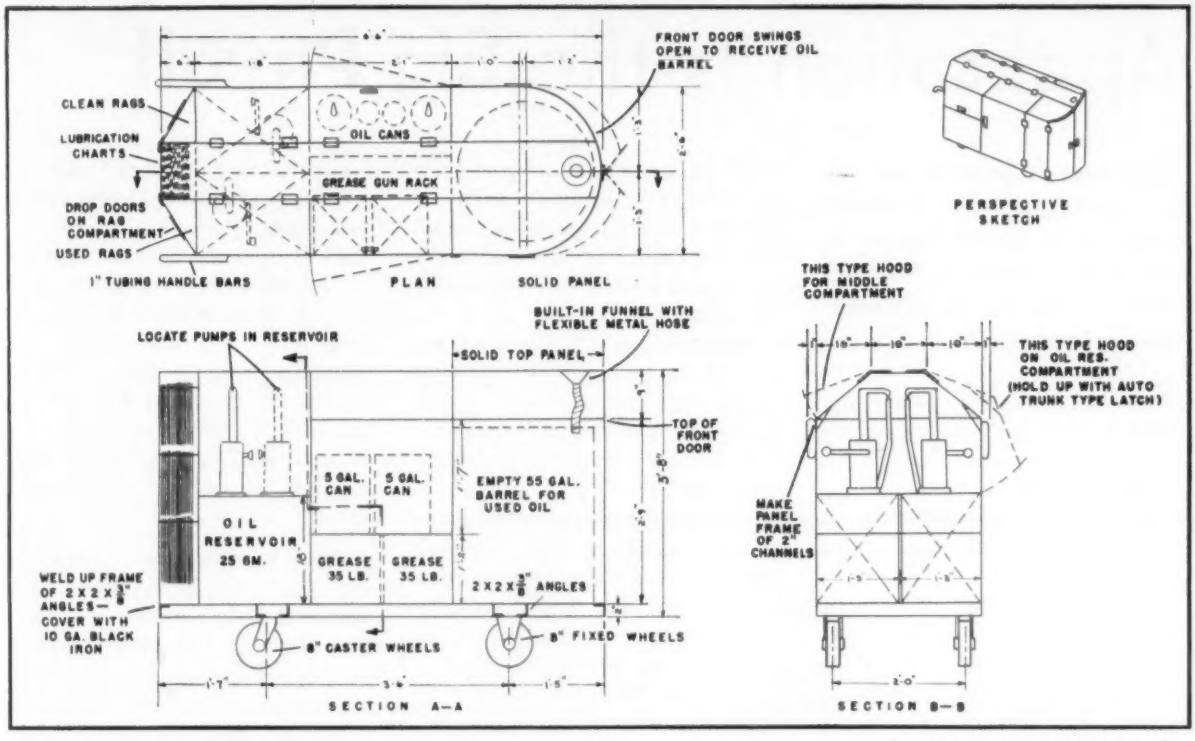
Indoor Storage Rack



Courtesy Socony Mobil Oil Co., Inc.

SPACE SAVER: Build or buy modular racks like this to store lubricant drums indoors. Hinged end stops hold drums in place and permit easy loading and unloading with fork lift trucks or other elevating devices. Grounding the drums as shown will provide an added measure of safety.

Good Design for Your Oil Wagon


FRONT DOOR SWINGS OPEN TO RECEIVE OIL BARREL
CLEAN RAGS
LUBRICATION CHARTS
OIL CANS
GREASE GUN RACK
DROP DOORS ON RAG COMPARTMENT
USED RAGS
1" TUBING HANDLE BARS
PLAN
SOLID PANEL
PERSPECTIVE SKETCH
THIS TYPE HOOD FOR MIDDLE COMPARTMENT
THIS TYPE HOOD ON OIL RES. COMPARTMENT (HOLD UP WITH AUTO TRUNK TYPE LATCH)
BUILT-IN FUNNEL WITH FLEXIBLE METAL HOSE
LOCATE PUMPS IN RESERVOIR
SOLID TOP PANEL
TOP OF FRONT DOOR
5 GAL. CAN
5 GAL. CAN
EMPTY 55 GAL. BARREL FOR USED OIL
OIL RESERVOIR 25 GAL.
GREASE 35 LB.
GREASE 35 LB.
2 X 2 X 3/8" ANGLES
WELD UP FRAME OF 2 X 2 X 3/8" ANGLES— COVER WITH 10 GA. BLACK IRON
8" CASTER WHEELS
8" FIXED WHEELS
MAKE PANEL FRAME OF 2" CHANNELS
SECTION A—A
SECTION B—B

Courtesy Socony Mobil Oil Co., Inc.

BUILD IT YOURSELF: This suggested design provides space for everything needed on a lubrication tour.

tings, sump pumps, wiping-cloth receptacles, and the like. Since all dispensing equipment needs regular cleaning, space for this work is needed, also.

It's helpful, in addition, to provide desk and filing space either in or adjacent to the oil room for certain paperwork phases of your planned program.

The familiar drum faucet, used in conjunction with a rocker-type rack, is both an efficient and economical oil-dispensing device. So are the several types of positive-delivery pumps that can be inserted into the bung of an oil drum. A separate drum faucet or pump should be used for each type of oil, however.

Care With Grease — Grease is harder to dispense than oil. Moreover, once the lid of a grease drum or pail is removed, the contents are more likely to become contaminated. Foreign materials can't possibly settle out of grease; they are bound to be transmitted to your plant equipment.

Dispensing grease from an open drum by using a paddle invites this kind of trouble. It's far better to use paddles only for stiff grease that can't be dispensed with a pump, and to use metal paddles at that. Wooden ones are apt to splinter and contaminate the lubricant.

Air-operated pumps will dispense up to 20 lb of soft grease per minute directly through the bung of a drum into your transport-type lubricating device. They're good insurance against contamination.

Application Aids—For carrying lubricants from the oil room to the actual point of lubrication, you have a wide choice of equipment. Conventional hand oil cans and grease guns still have a place in even the most sophisticated planned lubrication programs.

But to service a large number of machines conveniently and quickly, you'll probably need some type of oil wagon. You can buy such wagons, or you can build them according to designs your lubricant supplier will be glad to furnish. The above sketch shows a design you might apply.

How Big?—Each wagon should be built to carry adequate supplies of necessary lubricants, plus the required oil cans and grease guns. In addition, it should have space for (1) a drum to receive used oil, (2) a supply of clean wipers and a receptacle for used ones, (3) the supply of small tools your lubrication serviceman must keep handy.

It's also important to label every container and dispensing device on the wagon so they're not likely to be used with the wrong products.

Careful attention to these storage, handling, and dispensing details will yield big returns for your lubrication dollar.

Application Is the Big Payoff

The finest lubricants you can buy only represent potential benefits until they're applied to moving machine parts. You can't afford to miss on the all-important application job.

■ All the lubrication dollars you invest in selecting good lubricants and keeping them clean can go for naught if someone or something doesn't get the right amount of oil or grease to the right spot at the right time.

Most lubrication troubles can be traced back to "someone" who wasn't where he was supposed to be. It makes little difference whether a machine goes down because one bearing didn't get the oil it needed, or because the reservoir of a whole centralized lubrication system ran dry. The point is that the human element failed again.

The Last Man—One lubrication engineer puts it this way: "No planned program is any better than the man with the oil can—or the whole drum full of oil—at the end of the line. If he doesn't squirt the can or empty the drum where and when he's supposed to, there goes the ball game."

Planned programs don't leave much room for arguing the merits of manual lubrication. Consider that a single machine of complex design and function may have, say, 200 bearings. Even barring the fact that many of them may be hard to reach with an oil can or a grease gun, the most conscientious crew of oilers you could imagine would be bound to miss one somewhere, sometime.

Costly Manual Methods—Moreover, manual lubrication is anything but a low-cost technique. In one plant that still uses the system, a major oil company estimates it costs $4 in labor to apply $1 worth of lubricant. Nor does all of the lubricant go where it's supposed to; a lot of it is wasted, literally poured on the floor.

Another thing: it's usually against safety rules to hand-lubricate machines when they're running. What would it cost you to stop a machine for one minute, or five, or ten, every few hours?

Multiply the answer by the number of machines in your shop and the number of potential lubrication "breaks" per day. You'll undoubtedly agree that the way to get the most for your lubrication dollar is to minimize the human element as much as possible.

Should You "Centralize"?—Does this mean you'll have to retrofit every machine in your plant with a complete centralized lubrication system? The answer is no, not every one, and maybe not any one. It all depends.

Your first big step should simply be away from out-and-out manual lubrication of spots that are either hard to reach, need frequent attention, or both. Your aim is to move in the general direction of more mechanized or automatic lubrication.

In moving this way you'll encounter a great many lubrication devices. Some are quite simple and inexpensive. Some are quite complex and cost a lot of money, but they can be well worth it.

Consider Simple Devices—All of these devices fit into what might be called the lubrication-by-reservoir concept. Some, such as the well known gravity sight-feed oilers, direct the flow from their reservoirs to one or more lubrication points. If one filling of the reservoir will last a full week, or perhaps a month, this may be as much as you need in the way of mechanized lubrication.

Flow from the simplest type of gravity feed oiler is continuous, and the rate can be adjusted over a wide range of a needle valve. Other designs provide for stopping and starting the oil flow, either manually or automatically. Such types might be all you need on equipment that operates infrequently or intermittently.

Other Handy Types—Vibrating-rod oilers, constant-level oilers, and wick-feed oilers are other reservoir-type units that stop short of complete centralized systems. They may fit your particular needs very well.

But until machines are built that need no oil or grease whatsoever, centralized lubrication systems are your best insurance that key points get the right amount of the right lubricant at the right time.

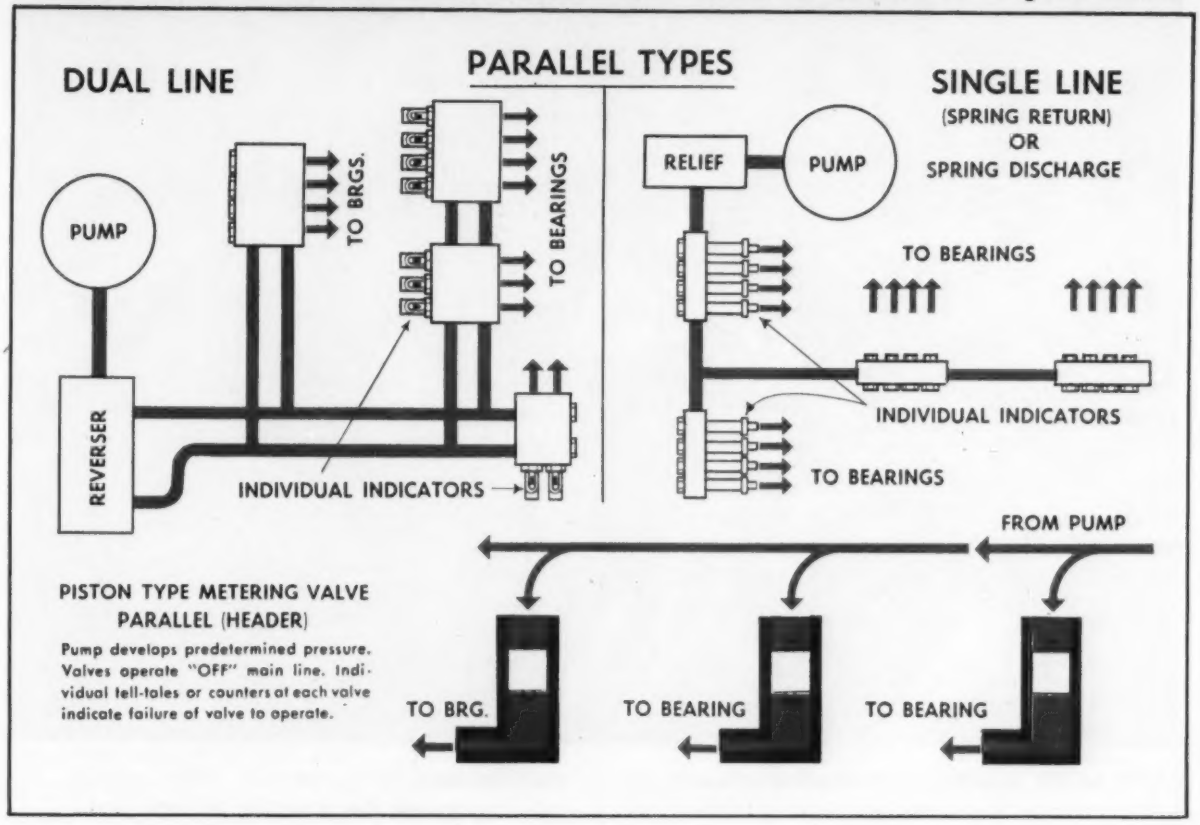
Such systems are built around the fact that lubricants are functional "parts" of modern industrial machinery. Indeed, more and more new machines include a centralized lubrication system as part of the basic design. And most systems can be installed fairly easily on equipment already in use.

Three Main Features—Centralized systems vary widely in design, but all of them have three features in common: (1) a pump or some other device for moving lubricant out of a reservoir; (2) pipes or tubes to carry the lubricant to key points; (3) metering devices to regulate the amount of lubricant delivered to bearings, ways, gears and pistons.

Some systems operate manually; others, semiautomatically; still others are completely automatic.

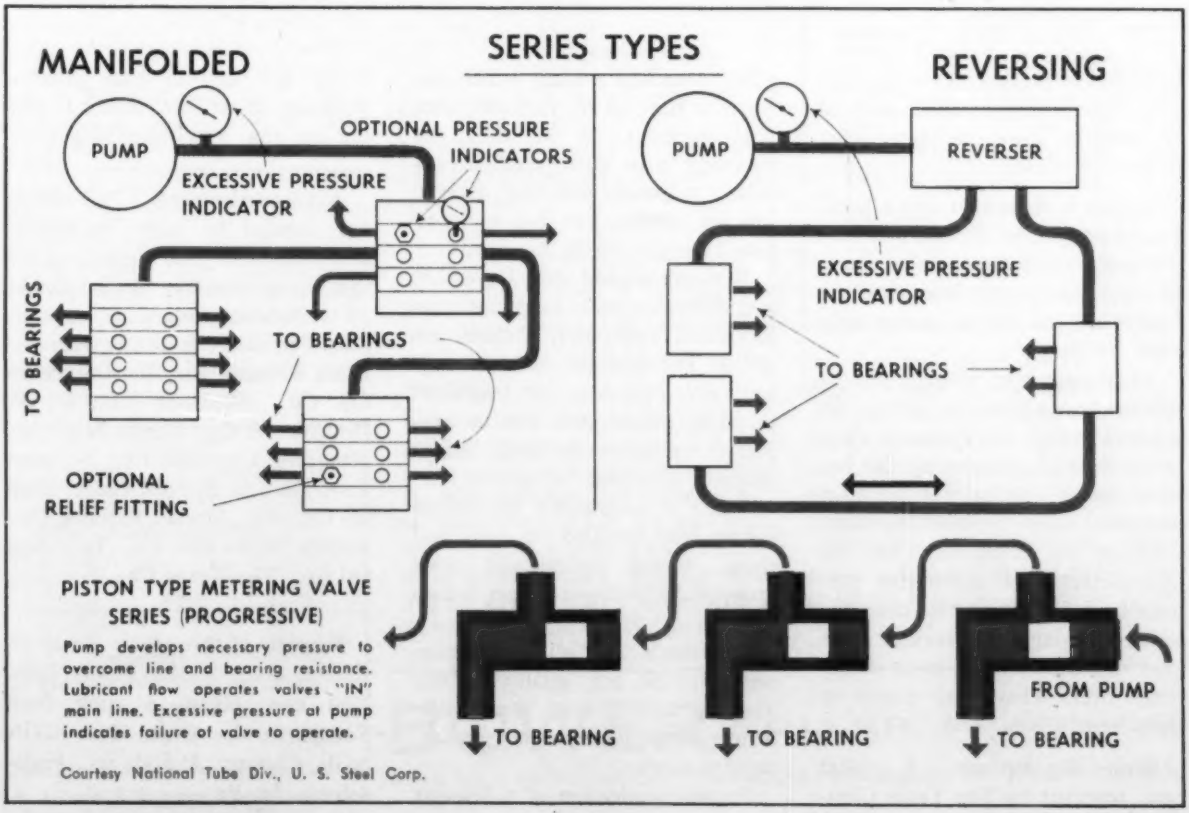
In manual systems, movement of a handle or lever actuates a pump which forces metered amounts of

Basic Centralized Grease Lubrication Systems



PISTON TYPE METERING VALVE
PARALLEL (HEADER)

Pump develops predetermined pressure. Valves operate "OFF" main line. Individual tell-tales or counters at each valve indicate failure of valve to operate.



PISTON TYPE METERING VALVE
SERIES (PROGRESSIVE)

Pump develops necessary pressure to overcome line and bearing resistance. Lubricant flow operates valves "IN" main line. Excessive pressure at pump indicates failure of valve to operate.

Courtesy National Tube Div., U. S. Steel Corp.

Sun Oil Co. photo

CAN'T STOP: A centralized lubrication system is virtually mandatory where bearings are hard to reach and machines must run continuously. Fully automatic systems require only that reservoirs be kept filled.

lubricant to the necessary machine parts. Obviously someone must be on hand to move the pump lever at the right time.

Timing is Important—In a semi-automatic system, the operator simply pushes a button to actuate a power-driven pump. Here, too, he must push the button at the right time.

Fully-automatic systems use a suitable timing device to actuate the lubricant pump. They come as close as possible to eliminating the human element, except for the man who must keep the reservoir filled.

Major oil companies and all manufacturers of centralized systems have files of specific case histories showing how savings have paid for installation costs many times over. They'll be happy to show them to you.

Shows Big Savings — A typical case, reported by The Texas Company, describes a plant which operates a bank of 60 multiple-index type machines. At one time, the company gave each machine operator a grease gun and allowed him 15 minutes per shift to lubricate 21 points on his machine.

It wasn't a good idea. Downtime was excessive; some machines were lubricated improperly, others not at all. The reasons: operator neglect; new operators not instructed properly; grease guns lost or misplaced; no grease on hand; fittings plugged, damaged, or missing.

When a centralized lubrication system was installed on each machine, annual maintenance costs dropped $72,000—a 60-pct reduction.

But that's not all. Production went up 20 pct; quality of the work produced was consistently better; scrap losses were substantially reduced.

Proper application of lubricants is the last step in your planned program, to be sure. But it is also the one that everything hinges on.

Acknowledgements—The editors are grateful to many individuals and companies for helping make this feature possible. Special thanks go to: Acheson Colloids Co.; American Petroleum Institute; The Atlantic Refining Co.; Esso Standard Oil Co.; Fluidwick Co.; E. F. Houghton & Co.; Judson Mfg. Co.; Monsanto Chemical Co.; National Tube Div., U. S. Steel Corp.; Shell Oil Co., Inc.; Sinclair Refining Co.; Socony Mobil Oil Co., Inc.; Sun Oil Co.; The Texas Co.

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BEARING BRIEFINGS

One in a series of technical reports by Bower

ROLLER GUIDANCE– VITAL FACTOR IN BEARING LIFE

Roller guidance has been established by the Anti-Friction Bearing Manufacturers Association as a major rating factor for roller bearings. There is a direct relationship between this factor and the life and capacity of a cylindrical roller bearing under load.

Figure 1 illustrates the results of a loose fit between a roller and the guiding ribs of the raceway. Because of lack of guidance by the ribs, the roller is free to skew and skid under load. Such a condition invariably leads to early bearing failure.

To achieve close roller fit and proper roller guidance, Bower precision grinds each bearing race on specially designed centerless grinders. In this operation, Bower positions the integral raceway ribs *from the theoretical centerline of the bearing*. This method produces bearings with high dimensional accuracy and perfect symmetry.

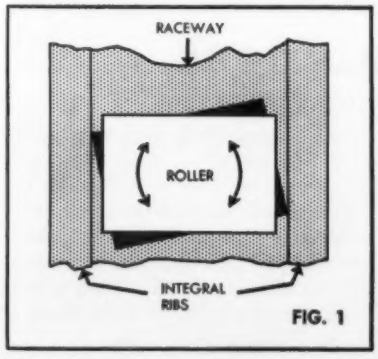
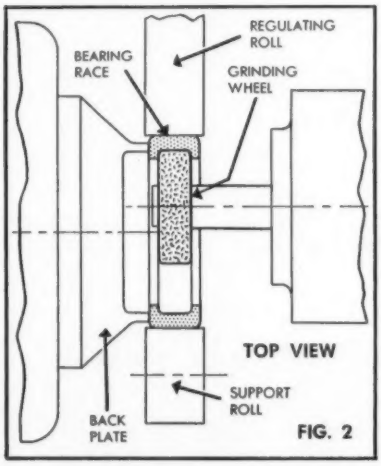
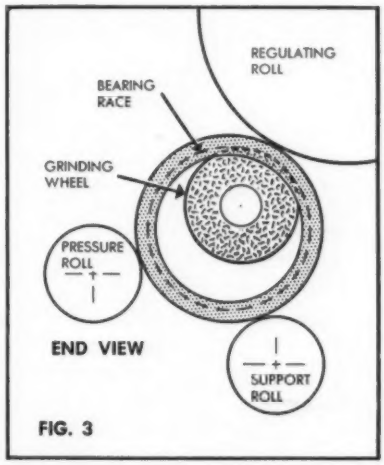


Fig. 1. Loose fit in raceway means poor roller guidance. Roller can skew and skid under load.

In addition, the close tolerances held in grinding the roller track and integral guiding ribs give Bower cylindrical roller bearings the ability to *take thrust in any direction*. A Bower cylindrical roller bearing has thrust capacity of from 10-15% of its rated radial capacity!



Figures 2 and 3 diagram the centerless grinding method used to finish Bower raceways. Use of this technique assures not only optimum roller guidance and maximum bearing life, but also virtually eliminates bearing runout. BEARING SYMMETRY WHICH RESULTS FROM THIS TECHNIQUE PERMITS ACCURATE SHAFT LOCATION REGARDLESS OF HOW THE OUTER RACE AND ROLLER ASSEMBLY ARE INSTALLED. IT COMPLETELY ELIMINATES THE POSSIBILITY OF IMPROPER INSTALLATION.



★ ★ ★ ★

Whatever your bearing needs, we suggest you consider the advantages of Bower bearings. Where product design calls for tapered or cylindrical roller bearings or journal roller assemblies, Bower can provide them in a full range of types and sizes. Bower engineers are always available, should you desire assistance or advice on bearing applications.

BOWER ROLLER BEARINGS

BOWER ROLLER BEARING DIVISION – FEDERAL-MOGUL-BOWER BEARINGS, INC., DETROIT 14, MICHIGAN

Photograph by Bruce Davidson

TOM JONES AND HIS GENERAL STORE

If it's aluminum, Tom Jones has it. You can call Tom or any other Alcoa district sales manager and get aluminum in particles so small that 15 billion just fit a teaspoon . . . closed die forgings up to 13 ft long from the 50,000-ton press we operate for the Air Force . . . or decorative sheet that shimmers with light from millions of spangles beneath its satin surface.

But Alcoa has less fancy items, too. Castings from the simplest sand mold to intricate forms in plaster molds. Screw machine stock that knows no limit on the rate of feeds and speeds, except the capacity of the screw machine itself. A heat-resistant alloy that sets records for strength at 600° F.

With more commercial forms of aluminum in every temper, size and alloy, Alcoa can sell without bias, filling orders to fit your needs and not to suit the limitations of a lesser product line. It's another way we put more than 16 ounces of metal into every pound of Alcoa® Aluminum and another added value you gain each time you call your local Alcoa sales office. Aluminum Company of America, 2018-H Alcoa Building, Pittsburgh 19, Pa.

ALCOA ***helps you design it, make it, sell it***

Alcoa has hundreds of Tom Joneses to help you design it, make it, sell it

All of Alcoa's skills are mobilized to a single purpose: To put more than just 16 ounces of metal in every pound of Alcoa Aluminum you buy. Here are 12 of the dozens of ways to do it:

1. Research Leadership, bringing you the very latest in aluminum alloys and applications.

2. Product Development by specialists in your industry and your markets.

3. Process Development Labs for aid in finishing, joining and fabricating.

4. Service Inspectors to help solve production problems at your plant.

5. Quality Control to meet top standards or match your special needs.

6. Complete Line including all commercial forms, alloys, gages, tempers.

7. Availability via the nation's best stocked aluminum distributors.

8. Foremost Library of films and books to help you do more with aluminum.

9. Trained Salesmen with a wealth of on-the-spot information.

10. Sales Administrators constantly on call to service your orders.

11. Year-Round Promotions expanding your old markets, building new ones.

12. The Alcoa Label, leading symbol of quality aluminum, to mark your goods.

Added Values With Alcoa Aluminum

. . . is a case book of Alcoa special services and a guide to their availability in design, manufacture and sales. Your copy, with some of the most rewarding information you may ever read, is waiting and it's FREE. Write: Aluminum Company of America, 2018-H Alcoa Building, Pittsburgh 19, Pa.

New Patents In Metalworking

Hard Surfacing Alloy

Improved hard surfacing alloy suitable for brazing and metal spraying operations, H. S. Gonser (assigned to Wall Colmonoy Corp., Detroit), Jan. 13, 1959. A nickel-base alloy for hard surfacing and Spraywelding composed of 11 to 15 pct Cr, 2.5 to 3.5 pct B, 3 to 5 pct Si, 3 to 5 pct Fe, 14 to 17 pct W, 0.5 to 1.2 pct C, balance Ni. No. 2,868,639.

Metalizing Composition

Improved metallic coating suitable for surface coating of metals to improve their wear- and corrosion-resistance and their capacity to retain lubricants, and to build them up dimensionally. W. S. Bowles (assigned to Wall Colmonoy Corp., Detroit), Jan. 13, 1959. An intimate mixture in powder form of a nickel-base alloy with a metal that is softer than the base alloy, the overall composition being approx. 0.04 to 0.7 pct C, 12 to 18 pct Cr, 1 to 2 pct B, 2 to 3 pct Si, 32 to 43 pct Ni, balance Fe. No. 2,868,667.

Casting Process

Metal casting process and elements and compositions employed in same, T. Operhall (assigned to Derald H. Ruttenberg, Chicago, Ill., as trustee), June 30, 1959. Economical method for producing metal castings to accurately controlled dimensions and in complicated shapes. Use is made of fine sand or calcined refractory grain in a thermosetting resinous binder. No. 2,892,227.

Charging Apparatus

Charging apparatus for steel making furnaces. A. Calderon (assigned to Calderon Automation, Inc., Ravenna, O.), June 30, 1959. System and aparatus for charging open-hearth steel furnaces situated side-by-side in a battery. Trains of buggies are eliminated, thus avoiding floor congestion. This system can be adapted to existing open-hearth plant conditions. No. 2,892,553.

Desulphurization

Metallurgical process, C. R. Austin and R. F. Rinesch (Austin assigned to Henry J. Kaiser Co., Oakland, Calif.; Rinesch assigned to Vereinigte Oesterreichische Eisenund Stahlwerke A. G., Linz, Donau, Austria), June 30, 1959. Method for removal of sulphur during the blowing of a steel melt with oxygen or oxygen-enriched air. Water vapor or liquid water is introduced to the surface of the melt at the start of the blow. The water is cut off 5 to 20 minutes before the end of the blowing period. Hydrogen produced by dissociation of the water desulphurizes the molten metal. No. 2,892,699.

Hardenable Stainless

Hardenable stainless steel, C. S. Walton and W. F. White (assigned to U. S. Steel Corp., a corporation

URICK'S DUCTILE IRON

Courtesy RELIANCE ELECTRIC & ENGINEERING CO., Cleveland, O.

MOTORS . . . . from the Lakes to the Sea

This 1300-pound URICK casting (a fan cooled motor stator frame made to Navy specifications) will withstand extra stress and strain and has better corrosion resistance because it is Ductile Iron. URICK recommends and successfully casts Ductile whenever greater tensile strength and higher impact value are of prime consideration because it has most of the advantages of steel, yet because of its high molten fluidity, it will take intricate shapes not possible with other high strength metals. Other advantages are—Ductile castability permits weight reduction while maintaining required physical properties . . . superior machinability reduces machining time and consequently results in longer tool life. There are other advantages and economies to Ductile when recommended, engineered, and cast by URICK, ask about them.

**This fan cooled motor stator frame to US NAVY specifications is cast in 16 different sizes from 16" to 42".*

Send for Bulletin on URICK's Ductile . . . ask for catalog on URITE gray iron and URICK's facilities, too! Remember, URICK starts with 'U.'

URITE CASTINGS

URICK FOUNDRY

ERIE, PENNSYLVANIA

LICENSED UNDER PATENTS OF THE INTERNATIONAL NICKEL COMPANY., INC.

PATENT REVIEW

of N. J.), June 30, 1959. An age-hardenable martensitic stainless steel is produced by thermal treatment and age-hardening of an austenitic steel containing 0.05 to 0.08 pct C, 16 to 17.5 pct Cr, 5.5 to 6.75 pct Ni, 0.9 to 1.8 pct Al, 0.12 to 0.18 pct N, balance Fe. No. 2,892,702.

Hydrogen Elimination

Hydrogen elimination in treatment of metals, W. P. Burroughs (assigned to General Motors Corp., a corporation of Del.), July 7, 1959. To eliminate hydrogen, with resulting hydrogen embrittlement, in operations where metal members are tumbled over each other in a aqueous solution, an oxidizing salt containing a cation of ammonia, sodium, potassium, or lithium and an anion of nitrate, nitrite, permanganate, or chromate is added to the solution. During tumbling the nascent hydrogen is oxidized to form water. No. 2,893,181.

Stainless Weld Wire

Stainless steel for weld, G. E. Linnert and R. M. Larrimore, Jr. (assigned to Armco Steel Corp., Middletown, O.), July 14, 1959. Stainless-steel weld wire comprises, e.g., 24 to 26 pct Cr, 19 to 22 pct Ni, 7.1 to 16.7 pct Mn, up to 0.25 pct C, balance Fe. Other compositions using these and other alloying metals are cited for weld electrodes and submerged-arc welding electrode wire. No. 2,894,833.

Steel Casting

Steel casting process and means for carrying out the same, L. J. Martens, July 21, 1959. Method and apparatus for casting steel whereby the danger of hollows is eliminated by the constant flow of steel in the container, which pushes the metal toward the ingot molds under atmospheric pressure and the

weight of the column of molten metal, so that the slab is sound from end to end. No. 2,895,189.

Oil-Permeable Steel

Oil-permeable steel and method for manufacturing, S. Kawasaki, June 30, 1959. Four-stage heating process for manufacturing an oil-permeable porous carbon steel, starting with a melt comprising 1.5 to 1.6 pct C, 0.5 to 2 pct Si, and the balance Fe. No. 2,892,745.

Austenitic Steel

Single phase austenitic steel, W. R. Kegerise and B. T. Lanphier (assigned to The Carpenter Steel Co., Reading, Pa.), June 23, 1959. An austenitic steel having enhanced stress rupture properties at elevated temperatures comprises 19.5 to 24 pct Cr, 8 to 13 pct Ni plus Mn (each being at least 4 pct), 0.15 to 0.4 pct C, 0.5 to 3 pct Cu, 0.15 to 0.35 pct N, and the balance Fe. Such a steel is particularly useful in fabricating valves for internal combustion engines. No. 2,891,858.

Passivating Stainless

Passivation of stainless steel alloys, C. E. Carrigan (assigned to Fairchild Engine & Airplane Corp., Deer Park, Ill.), June 16, 1959. A stainless steel, e.g., AISI Type 303, is passivated by immersion in a pickling bath, heating in an oxidizing atmosphere, and finally reacting it with H_2O_2. No. 2,890,974.

Resist Etching

Resist etching, S. Eisner (assigned to Ford Motor Co., Dearborn, Mich.), May 19, 1959. Resist compositions for the etching of corrosion - resistant stainless steels. These compositions withstand the corrosive action of the acid solution used to etch the steel and may be precisely deposited upon the steel so that a clear sharp etch pattern is obtained. No. 2,887,367.

In Dust Collection Systems...

SF Precipitator at a steel plant.

design makes the difference

Higher efficiency of Buell 'SF' Electric Precipitators is the result of exclusive engineering features. For example, Buell's *Spiralectrodes* emit 50% to 100% more electrons than other types . . . and *maintain* their efficiency. Positive gas flow control through adjustable baffles prevents scouring and eddying. And Buell's Unique Continuous Cycle Rapping practically eliminates "puffing".

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Lower installation cost of Buell's time-proved simplified design makes erection faster and easier. Spiralectrodes, for example, are self-tensioning, require no weights. Flexibility of power supply means easier installation, operating safety.

Lower maintenance cost is the result of many details of superior design. And sectionalized design permits shutting down part of a unit without interrupting service in the rest of the unit.

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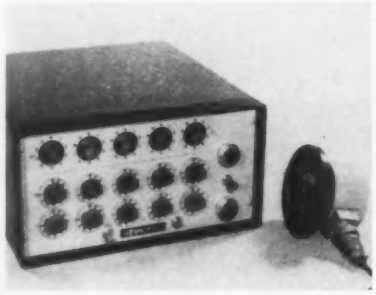
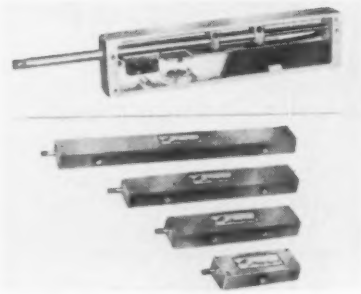


Automates Cutting-to-Length Operations

For use with all types of shearing mechanisms which can be activated by relay closure, a "Digital Length Controller" operates in a wide range of heavy automatic cutting-to-length operations. Precision sensing devices emit pulses to actuate cutoff when material reaches exact selected length. The controller comes with these features: (1) control for instant changeover to new length, (2) automatic shearing time delay for all speeds, (3) automatic sequencing control for mutiple control functions, and (4) programmed control of batches of work by tape. (Dynapar Corp.)

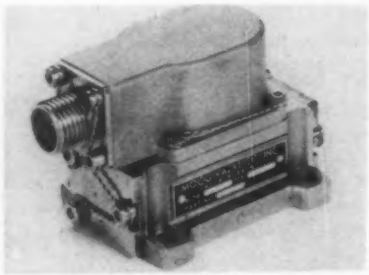
For more data circle No. 30 on postcard, p. 155



Controls Linear Movements Electrically

Packaged electromechanical units control linear machine movements electrically. Designed for automation, they save up to 50 pct over custom installations. Switches are operated by adjustable cams on a sliding actuator tube, coupled to an air cylinder or sliding machine member, thus controlling machine movements to preset points. With simplified wiring and choice of conduit openings, units are enclosed in dustproof aluminum housings. Four standard sizes are available for different stroke-length requirements: 0 to 4, 8, 12, and 24 in. (Linear Controls Co.)

For more data circle No. 31 on postcard, p. 155



Servovalves Are Made to Specifications

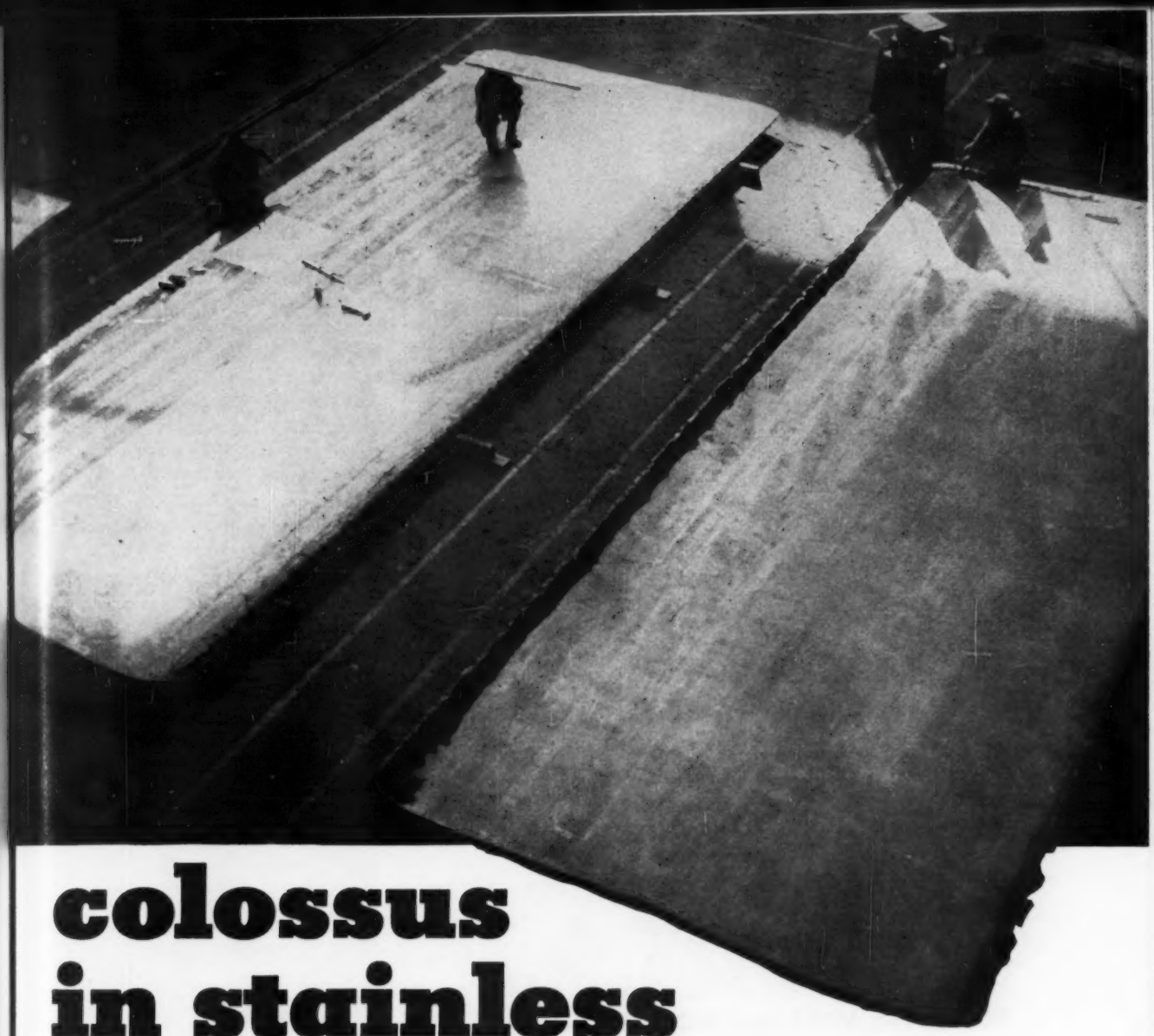
Two new series of hydraulic flow control servovalves are available in production quantities built to requirements of specific systems. Employing the proved double nozzle flapper design with mechanical feedback from second to first stages, they are well suited to precise hydraulic control at high power levels where small size and high performance are essential. Small quantities are immediately available at rated flows of 1, 2, 4, or 8 gpm at 1000-psi valve drop. (Moog Servocontrols, Inc.)

For more data circle No. 32 on postcard, p. 155

Allow Setting Up Machines Without Lag-Down

A line of machine mounts eliminate the need to lag down production machines, and simplify moving machinery when necessary. Doing away with lag screws and special foundations, they bring great time savings in installation or relocation. Fiberglass materials encased and bonded with neoprene provide excellent isolation efficiency and internal damping to control vibration and shock. Mounts have a level-control feature and come in three sizes to handle loads to 8000 lb each. (Consolidated Kinetics Corp.)

For more data circle No. 33 on postcard, p. 155



colossus in stainless

...world's largest stainless steel plates ready for processing at Carlson

SOMETIMES Carlson service is a cooperative venture that gets practically impossible jobs done. The processing and finishing of these, the world's largest stainless steel plates, is an example of such teamwork.

As this was a "first time" job, the most careful planning and coordination had to be exercised. Oversize ingot molds and a 70-ton capacity furnace had to be used. It took the country's largest plate mill to roll the ingots to slabs, the slabs to plates. The finished plates, cut-to-shape by Carlson specialists, met every customer requirement.

These huge plates, of Type 304 stainless steel, were made to Specification A-240 Grade S (ASTM A240-T). Each plate weighed over 49,000 pounds; one measured 461″ x 179″ x 2″; the other 451″ x 184″ x 2″. Destined for a nuclear application, these plates were flame-cut and abrasive-cut to make two half-circles. The entire order totaled nearly 100,000 pounds.

Cooperation made this "colossus" a success—cooperation under the knowing eyes of Carlson specialists. This same team is ready to work on your order. We invite you to write, wire or phone for further information.

G.O.CARLSON *Inc.*

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District Sales Offices in Principal Cities

PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)

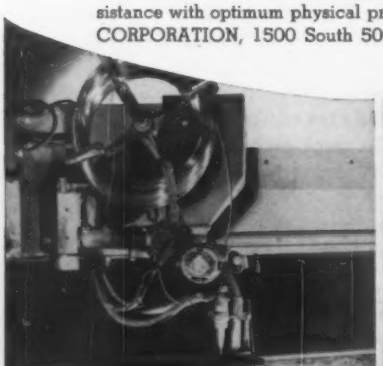
Job Report Courtesy of
Alco Products, Inc., Schenectady, N. Y.

Nuclear pressure vessel stainless clad at low cost

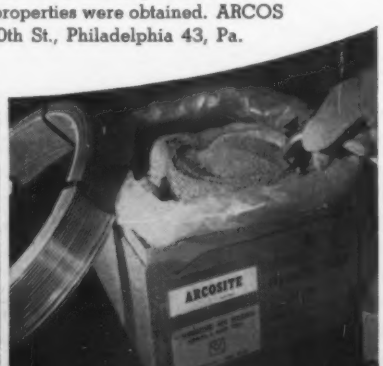
USE ARCOS

STAINLESS WIRE and BONDED FLUX

This "barrel" is one of several that comprise a nuclear pressurizer to operate under highly corrosive conditions. To reduce costs, Alco Products forged the shell of ASME A-336, 2—4 inch thick manganese molybdenum steel and clad the inside with stainless. The illustration shows the second pass overlay which was made by submerged arc using Arcos Chromenar K-LC (Type 308) bare wire and Arcosite S4 flux. Lower cost, and high corrosion resistance with optimum physical properties were obtained. ARCOS CORPORATION, 1500 South 50th St., Philadelphia 43, Pa.



Bare Wire



Arcosite Flux

DESIGN DIGEST

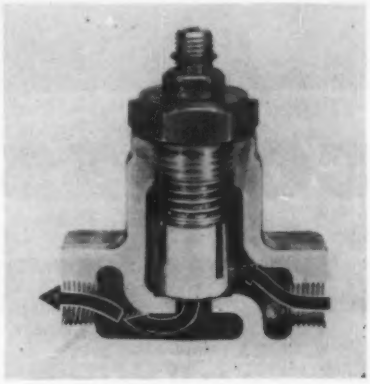
Free-Cutting Copper

Cheaper than tellurium copper, a new sulphurized copper rod alloy has equal machinability and electrical conductivity of 95 to 97 pct. Excellent for hot or cold working, it has about the same mechanical properties as tellurium copper, but better ductility. High thermal conductivity suggests additional uses where rapid heat dispersal is required, as in welding torch tips or soldering tips. (Bridgeport Brass Co.)

For more data circle No. 34 on postcard, p. 155

Speed Control Valves

Special poppet design brings trouble-free operation to a series of speed-control valves. Four varied-length orifices replace the conventional needle-type control and permit the same micrometer air-flow



adjustment, but with no danger of clogging, as the device is self-cleaning with a wiping action. For pressure air, the poppet lifts off the seat, permitting unrestricted flow. (Automatic Valve Co.)

For more data circle No. 35 on postcard, p. 155

Drying Agent

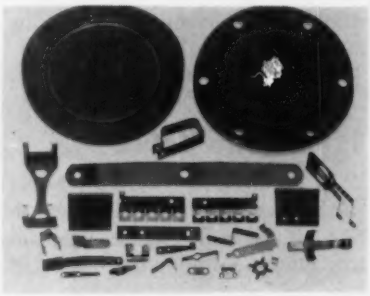
Announcement has been made of a new, improved formulation for a water displacing liquid used for rapid shedding of water from metal parts to promote rapid drying. The solvent penetrates into crevices and forces water from the surface. It is used for drying of parts after plating, pickling, coloring, cleaning,

etching, and phosphating. (Enthone Inc.)

For more data circle No. 36 on postcard, p. 155

Phosphor-Bronze Parts

Phosphor-bronze stampings held to tight tolerances and excellent concentricity are available. Material

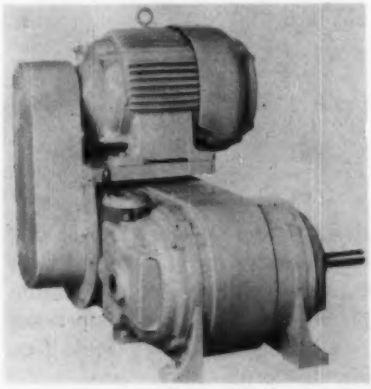


of specified thickness and temper is precision stamped to order. (Federal Tool & Mfg. Co., Inc.)

For more data circle No. 37 on postcard, p. 155

Variable-Speed Drive

A mechanical variable-speed drive features separate-motor construction and horizontal assembly. A wide infinitely variable speed range comes through proper selec-

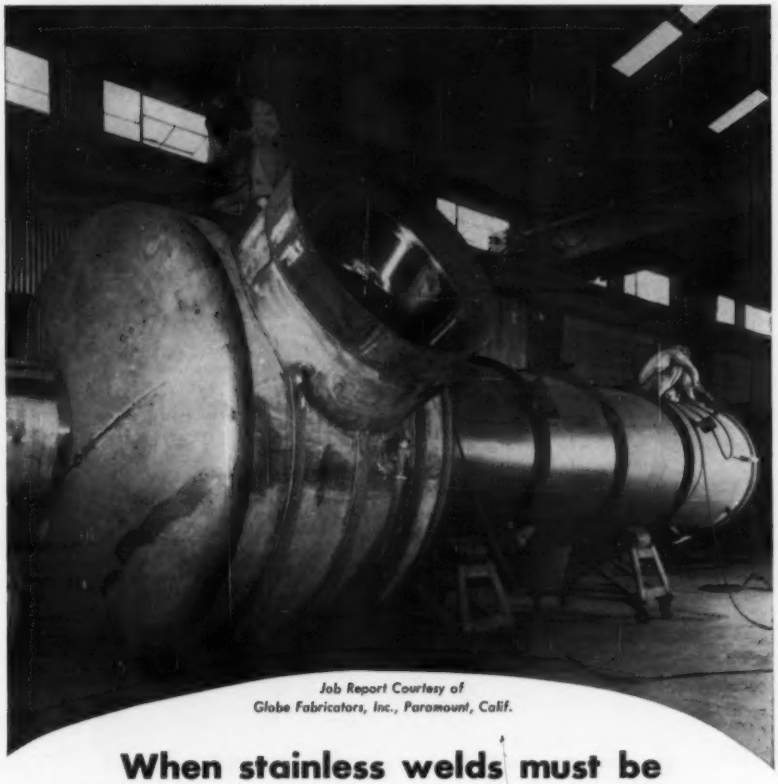


tion of the V-belt and timing belt. Motors run from ½ to 30 hp. Output speeds from 1.2 to 4660 rpm are available, with speed variations from 2:1 to 10:1. (Sterling Electric Motors, Inc.)

For more data circle No. 38 on postcard, p. 155

Timing Device

A 30-minute synchronous-motor-driven timer features positive time selection and visual time indication. Exact time is selected with a pointer. In operation, the dial shows the



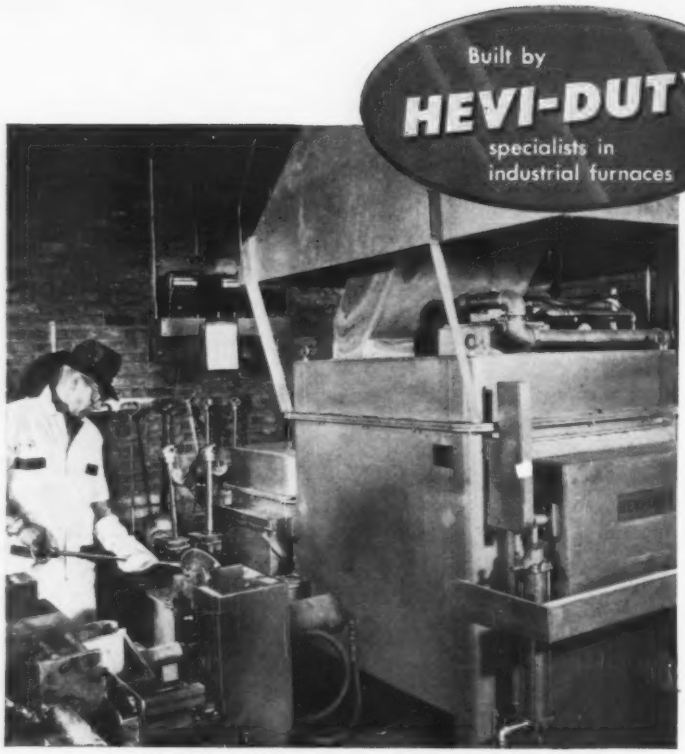
Job Report Courtesy of
Globe Fabricators, Inc., Paramount, Calif.

When stainless welds must be highly sanitary and corrosion resistant

WELD WITH ARCOS

STAINLESS ELECTRODES

Welded citrus fruit processing equipment such as this must *resist corrosion*, must *not contaminate* the food and must be *strong*. Type 304 stainless, used for all food contacting sections, was welded with Arcos Chromend K (Type 308) electrodes. For welding the non-stainless supporting members to stainless sections, Arcos Chromend HCN (Type 310) electrodes were used. Again, Arcos electrodes provided multiple benefits that cost so little and contribute so much to dependable equipment operation. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



This Combination Melting and Holding Furnace Matches In-Sink-Erator's Requirements

Volume production in limited floor space is one reason why the In-Sink-Erator Company, Racine, Wisconsin, chose a Hevi-Duty Double Chamber Dry Hearth Aluminum Melting Furnace. It covers only 32 square feet of floor space, yet it melts and holds up to 400 pounds of aluminum per hour. The relatively cool furnace exterior has permitted a permanent mold machine to be installed adjacent to the dip-out chamber. In-Sink-Erator, the originator and leading manufacturer of household and commercial garbage disposers, does all of their own permanent molding of disposer shells.

The furnace fits into In-Sink-Erator's time schedule as well as its space requirements. It heats up to operating temperature in only 2½ hours. This means it can be shut down over weekends or at night without excessive loss of production time. Further, the simplicity of this furnace permits minimum maintenance and direct firing provides low fuel consumption.

Write for Bulletin 593 for complete details on Hevi-Duty Melting Furnaces.

- **Industrial Furnaces and Ovens electric and fuel**
- **Laboratory Furnaces**
- **Dry Type Transformers**
- **Constant Current Regulators**

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

full interval and time remaining. Upon power failure, the timer automatically returns to starting position for a new full cycle. The timer is designed for "on-the-job" interchangeability with 1-, 3-, or 5-minute units from the same line. (Cutler-Hammer Inc.)

For more data circle No. 39 on postcard, p. 155

Hydraulic Valve

A no-leak, two-way, pilot-operated solenoid valve controls the flow of hydraulic fluids. Featuring low power consumption, fast positive response, and low pressure drop, it is of cartridge-type construction for quick removal and easy maintenance. It operates on 0.185-amp, 25-v dc. Operating pressure is 3000 psi, temperature range —65° to 275°F. (Fluid Regulators Corp.)

For more data circle No. 40 on postcard, p. 155

Non-Slip Surfacing

A highly abrasive, non-slip surface is provided by a modification of a recently marketed floor material. The components — adhesive epoxy resins and hard emery— come in separate packages so that the liquid plastic can be applied first and the aggregate seeded into the surface, providing greater slip-proofing. Bonding well to all floor surfaces, it offers superior resis-

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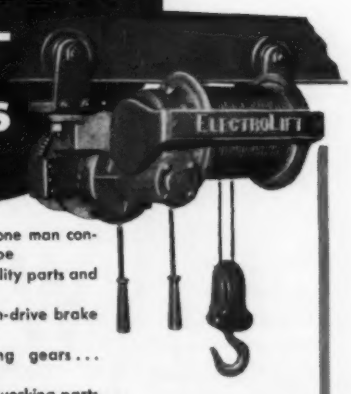
ELECTROLIFT WORM-DRIVE HOISTS



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- **Safe**—alloy steel worm-drive brake holds loads securely
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- **Clean and quiet**—working parts are fully enclosed

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WORM DRIVE ELECTROLIFT HOISTS

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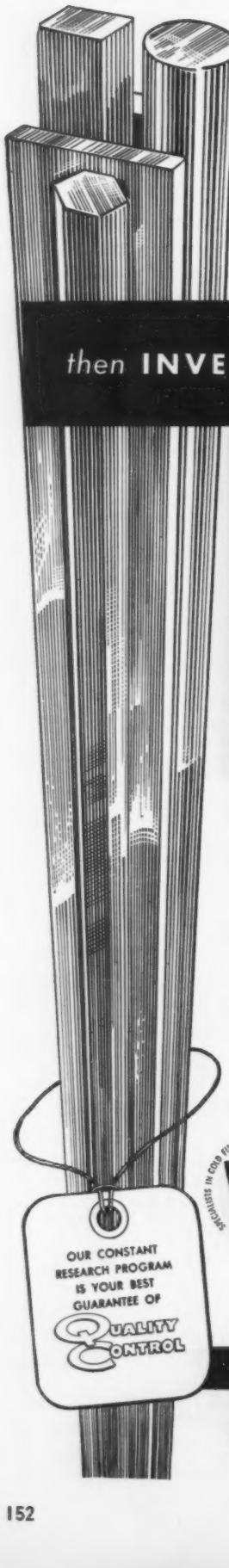

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DESIGN DIGEST

tance to chemical attack and mechanical abuse. (Walter Maguire Co., Inc.)

For more data circle No. 41 on postcard, p. 155

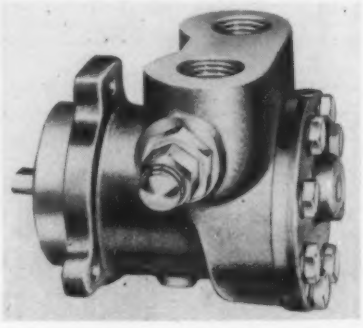
Drawing Lubricant

A bonded drawing lubricant has been developed for hot forming of sheet metal such as titanium. Applied to the sheet and allowed to dry, it is removed after forming with a hot caustic dip or solvent cleaning. (EverLube Corp. of America)

For more data circle No. 42 on postcard, p. 155

Oil Pump

A spring-loaded single-lip seal design provides a new pump with greatest possible protection against leakage when used with all lubri-



cating and fuel oils and most hydraulic oils. It is furnished in six sizes with capacities to 6 gpm, for pressures to 500 psi, at 3600 rpm. (The Tuthill Pump Co.)

For more data circle No. 43 on postcard, p. 155

Corrosion Inhibitor

A water-soluble corrosion inhibitor provides 100-pct protection against corrosion in water systems. Odorless and non-irritating, it is not subject to rancidity or bacterial decomposition. It is recommended for use in pressure-testing, cleaning, washing, tumbling, heat-treating—in short, wherever water contacts ferrous metal parts. As an additive to soluble-oil cutting and grinding coolants, it provides abso-

lute rust protection. (Rust-Lick, Inc.)

For more data circle No. 44 on postcard, p. 155

Grinding Coolant

A soluble grinding coolant, dilutible up to 150 to 1, gives increased penetration at the contact between wheel and work, due to its low surface tension and superior wetting qualities. Fines and chips are separated quickly, improving finish. It increases wheel life and reduces downtime and wheel dressings. (Shear-Speed Chemical Products)

For more data circle No. 45 on postcard, p. 155

Aluminum Rod, Bars

Cold-processed aluminum round and hex screw-machine stock is available. The cold-process method produces stock of exceptionally good density, fine grain structure, and close tolerances, with peak performance during machining, making fewer secondary operations necessary due to the fine finishes attained. (Olin Mathieson Chemical Corp.)

For more data circle No. 46 on postcard, p. 155

NEW BOOKS

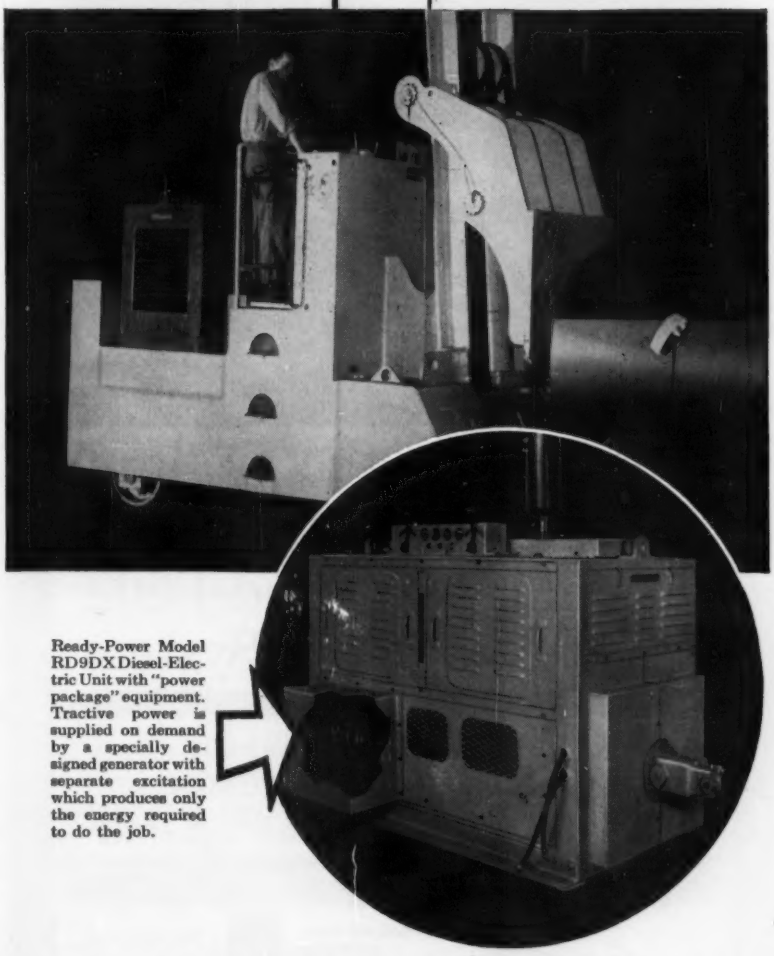
"New Metallizing Handbook" contains 345 pages of "how-to" information, including latest developments in spraying ceramics and hardfacing alloys, including tungsten carbide. Thoroughly covering the field, it is profusely illustrated. $5 per copy. Metallizing Engineering Co., Inc., 1101 Prospect Ave., Westbury, L. I., N. Y.

"Refractories Bibliography 1947-1956," compiled by The Joint Refractory Committee of the American Iron and Steel Institute and The Refractories Institute, contains over 9,500 abstracts from the periodical literature and of U. S. foreign patents on refractories in industrial use. 1822 pp. $7.50 per copy. University of Oklahoma Press, Norman, Okla.

New Diesel-Electric "Power Package" Does Both Jobs Economically

1 GENERATES TRUCK MOTIVE POWER

2 DIRECT-DRIVES HYDRAULIC PUMP



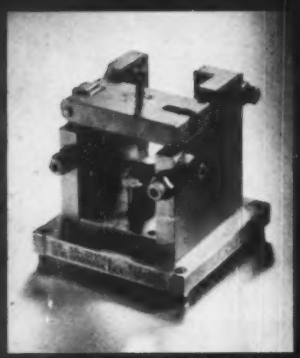
Ready-Power Model RD9DX Diesel-Electric Unit with "power package" equipment. Tractive power is supplied on demand by a specially designed generator with separate excitation which produces only the energy required to do the job.

Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Tooling with tape...



This drill jig: $280.00

This drill jig: $4.20

you can see the profit in point positioning with DIGIMATIC* model 202 Point-Positioning System

Ask us to arrange a demonstration with **your** parts.
Write for free 12-page booklet, "DIGIMATIC MODEL 202."
Also—movies shown at your shop or plant on request.

The lowest-cost complete point-positioning system for drilling, tapping, reaming, spot facing

*DIGIMATIC IS OUR TRADEMARK

STROMBERG-CARLSON
A DIVISION OF GENERAL DYNAMICS
1490 N. GOODMAN STREET • ROCHESTER 3, NEW YORK

FREE LITERATURE

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 155.

Spray Coatings

"Vacuum Metallizing Spray Coatings" is an 18-page booklet describing spray coatings for use in conjunction with metallizing thermoplastics, thermosetting plastics, metals, and glass. (Bee Chemical Co.)

For free copy circle No. 1 on postcard, p. 155

Casting Aluminum

A 32-page reference includes complete information on various casting processes suitable for aluminum, and includes recommendations on alloy selection. Tables present a variety of processing information. (Reynolds Metals Co.)

For free copy circle No. 2 on postcard, p. 155

Machine-Tool Clutches

A four-page bulletin describes twin-disk multiple-plate clutches for machine-tool applications. (Twin Disc Clutch Co.)

For free copy circle No. 3 on postcard, p. 155

Heat Treating

"Heat Treat Review," vol. 10, no. 1, reviews the quality and economy benefits derived from furnace heat treating in three specific applications: dies, threaded parts, and saws. (Surface Combustion Corp.)

For free copy circle No. 4 on postcard, p. 155

Automatic Presses

A line of presses for automatic production of metal stampings are described and illustrated in a 12-page bulletin. Various feed arrangements are illustrated. (The Minster Machine Co.)

For free copy circle No. 5 on postcard, p. 155

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Adjustable Drives

A 16-page catalog describes a new ¼- to 25-hp line of mechanical adjustable-speed drives, with speed adjusted by V-belt and adjustable-pitch pulleys. Special advantages of this design are pointed out. Output speeds vary from 5 to 4200 rpm, hp from 1 to 25. Selection data are included. (General Electric Co.)

For free copy circle No. 6 on postcard

Tape-Controlled Gager

An eight-page bulletin describes a numerically controlled gaging machine which can quickly and accurately check components of any shape at any desired number of coordinate points on their inner or outer surfaces. Use of the programmed tape eliminates cost and time of using templates and special gages, and gage data obtained can be used in any manner. (Pratt & Whitney Co.)

For free copy circle No. 7 on postcard

Die Springs

Three new diameters of 37-pct-deflection medium high-pressure chrome-vanadium steel die springs for metal stamping are described in a catalog insert. They are ⅜, ½, and ⅝ in., in lengths of 1 to 4 in. (The Producto Machine Co.)

For free copy circle No. 8 on postcard

Ultrasonic Cleaning

An application bulletin describes a technique for cleaning miniature differentials ultrasonically, in less than one minute, without disassembly. (Write on company letterhead to Acoustica Associates, Inc., Dept. S, Fairchild Court, Plainview, L. I., N. Y.)

Gearmotors

A 32-page bulletin contains technical information on a line of horizontal and vertical mounted gearmotors with capacities up to 125 hp and a variety of output speeds ranging from 780 to 1.2 rpm. (Hewitt-Robins, Inc.)

For free copy circle No. 9 on postcard

Nickel Casting Alloys

A 27-page booklet is a guide to the major nickel-containing casting alloys. It outlines properties and general applications for each alloy. (The International Nickel Co., Inc.)

For free copy circle No. 10 on postcard

Tube and Bar Stock

A bulletin describes standard and special tube and bar stock available in GC Meehanite, GA Meehanite, and Type #1 Ni-Resist, including a physical-properties chart as an application guide. The tube is extra strong, being made by the centrifugal casting process. (Centrifugally Cast Products Div., The Shanango Furnace Co.)

For free copy circle No. 11 on postcard

20-in. Band Saw

An eight-page bulletin describes a 20-in. band saw featuring infinitely variable drive from 50 to 4500 fpm, and equipped with all accessories, including a blade welder. (Rockwell Mfg. Co., Delta Power Tool Div.)

For free copy circle No. 12 on postcard

Indexing Units

Three models of cam-operated indexing units are completely described in a bulletin including drawings and tables of operating data. (Standard Tool & Mfg. Co.)

For free copy circle No. 13 on postcard

Wire Rope Fittings

Hooks, bridles, clamps, thimbles, and saddles for use with wire rope,

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **8/20/59**

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

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51	52	53	54	55	56	57	58	59	60
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No postage necessary if mailed in the United States

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Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FREE LITERATURE

in a variety of sizes, are specified in a 12-page brochure. (Newco Mfg. Co.)

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Blind Rivets

A 16-page brochure describes a new series of blind rivets, for high-strength structural fastening, featuring a "conical keystone lock." Positive mechanical locking action is obtained between a conical-tapered section on the pin and a corresponding section in the head. (Huck Mfg. Co.)

For free copy circle No. 15 on postcard

AtmosphereGenerators

A line of packaged hydrogen gas atmosphere generators is described in detail in a four-page bulletin. (Gas Atmospheres, Inc.)

For free copy circle No. 16 on postcard

Truck Instructors' Manual

A new Instructors' Manual is available as a guide for industrial truck operators' training programs. (Automatic Transportation Co.)

For free copy circle No. 17 on postcard

Vibrating Finisher

A 15-hp addition to a line of vibrating precision finishers is described in a four-page bulletin. (Lord Chemical Corp.)

For free copy circle No. 18 on postcard

Hydraulic Pump

A bulletin describes a two-stage, dual-volume, dual-pressure hydraulic pump which delivers from 600 cu in. of oil per minute at 100 psi to 50 cu in. per minute at 10,000 psi. (Owatonna Tool Co.)

For free copy circle No. 19 on postcard

Pouring-Ladle Shank

A wheeled shank described in a four-page bulletin enables one-man handling and pouring of ladles and crucibles. It has rubber tires, a movable counterweight, and a pneumatic lift for different mold heights. (Morehouse Machine Co.)

For free copy circle No. 20 on postcard

Skids, Boxes, Pallets

A line of material - handling equipment consisting of double-corrugated skid platforms, corrugated boxes, skid boxes, and pallets and pallet racks, is described in a 14-page catalog. (The Union Metal Mfg. Co.)

For free copy circle No. 21 on postcard

Degreasing Agent

A non-flammable, low-toxic degreasing agent is very similar in characteristics to carbon tetrachloride but much safer. It can be used in any type of degreasing operation except vapor-phase degreasing. Literature and prices are available. (Electro-Chemical Products Corp.)

For free copy circle No. 22 on postcard

Boxes and Baskets

A line of material - handling equipment for small and medium size parts, including boxes and baskets, hopper racks and lids, shelf racks, and feeder boxes and hopper extensions, is described in an eight-page catalog. (NesTier Corp.)

For free copy circle No. 23 on postcard

Wet-Blaster

A new model in a line of wet-blasters is designed for honing, cleaning, deburring, and blending. Its features, and examples of benefits accruing from its use in these operations, are presented in a brochure. (Tobin-Arp Mfg. Co.)

For free copy circle No. 24 on postcard

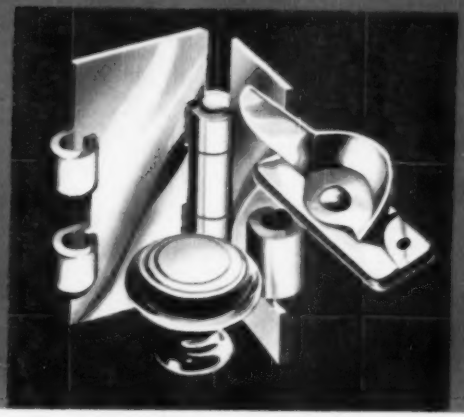
Armored Rubber Lining

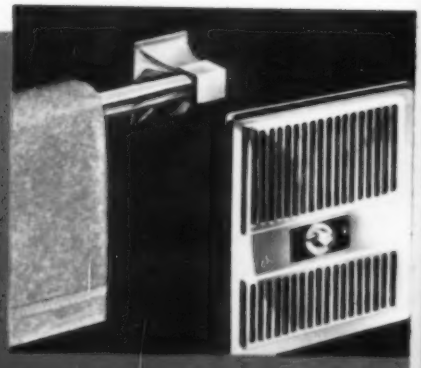
A four-page brochure describes a brand of steel-backed rubber lining especially compounded to withstand extreme abrasion. Easily formed, it can be used for chutes, sluices, bins, tumbling barrels, and in many other uses. (Goodyear Tire & Rubber Co.)

For free copy circle No. 25 on postcard

Fine to have around the house

for every stainless reason!





Superior

STAINLESS STRIP STEEL

At every turn, stainless serves in the modern home . . . brightens the decor, lightens every cleaning chore! From Superior Stainless Strip Steel, precise in specification for each specified need, are made scores of tarnish-proof, wear-resisting, care-banishing home products. ● Let us discuss our steels and your fabrication possibilities, without obligation of any kind.

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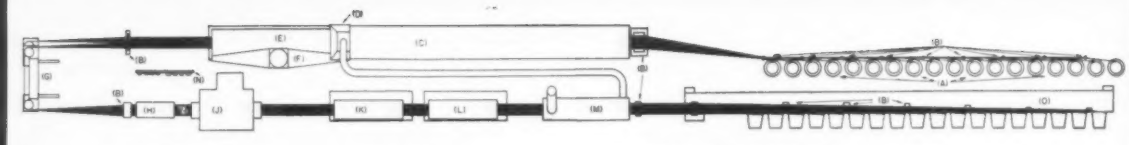
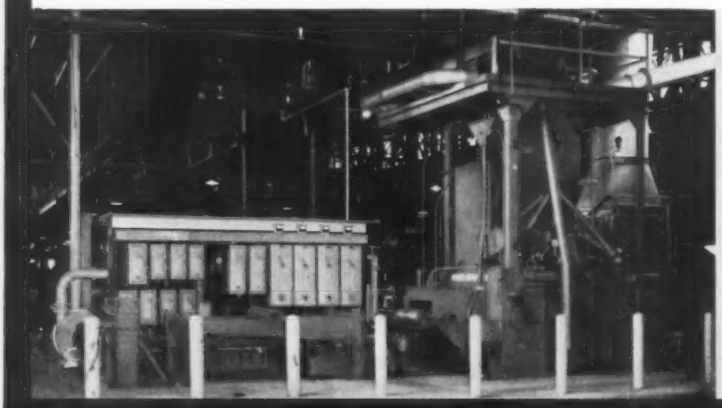
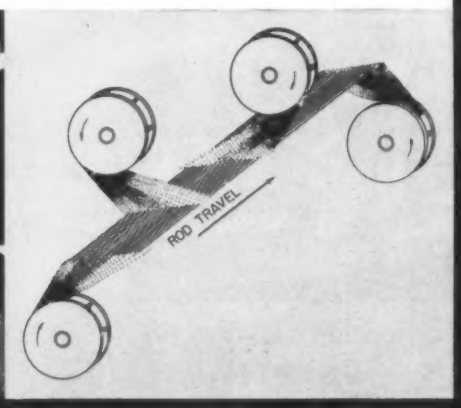
A NEW TWIST TO WIRE MAKING



A. PAY-OFF SWIFTS
B. ROD GUIDES
C. FURNACE
D. COLLECTING HOOD
E. LEAD BATH
F. EXHAUST HOOD
G. TURN AROUND
H. WATER COOLING BATH
J. WHEELABRATOR MACHINE
K. BORAX COATING BATH
L. LIME COATING BATH
M. DRYER
N. CONTROL PANEL
O. TAKE-UP FRAME





ROEBLING continuous wire production based on WHEELABRATOR® blast cleaning

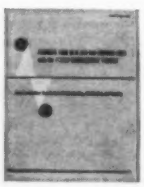
Continuous patenting, cleaning and coating of steel wire adds up to more efficient operation at lower cost, for John A. Roebling's Sons Corp.

The new processing line, installed at the Roebling mill, incorporates Wheelabrator airless blast cleaning as a key step in the operation. Wire now is patented and cleaned in one continuous operation, with a resultant decrease in labor cost.

Eighteen strands of steel wire pass simultaneously through the muffle furnace, lead quenching bath, Wheelabrator blast cleaning machine, coating baths, drying ovens, and thence to the take-up frame, in a compact operation occupying an area of 250 ft. long and 30 ft. wide. Normal production rate is about 6,000 pounds per hour. Speeds through the blast cleaning unit vary with the gauge of wire, with .250" diameter rod running at 34 fpm.

Wheelabrator mechanical cleaning eliminates the costly problems of acid disposal, and maintenance of acid pickling equipment. By promoting efficient "straight-line" production, it minimizes handling costs. The combined effect of cleaning and labor savings is a considerable reduction in the patenting and cleaning cost.

Write for Bulletin 148-D, illustrating use of the Wheelabrator process for producing finished wire from hot rolled rod in one continuous operation.

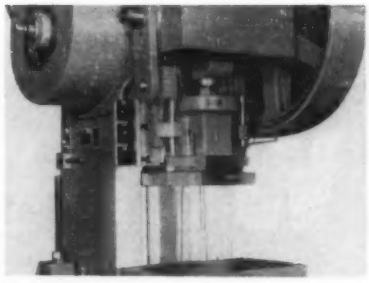


WHEELABRATOR
CORPORATION
510 South Byrkit Street — Mishawaka, Indiana
Canadian Division: Box 490, Scarborough, Ontario

WORLD'S LARGEST MANUFACTURERS OF AIRLESS BLAST CLEANING EQUIPMENT AND STEEL ABRASIVES

New Equipment and Machinery

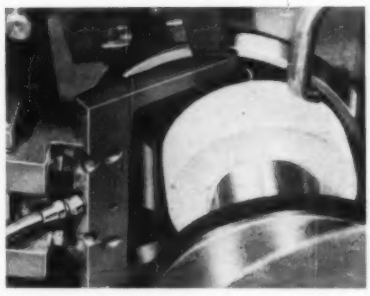
Press Features Recirculating Lubrication



A 75-ton, single geared, open back inclinable press features optional recirculating lubrication for main and connection bearings, gibs, gears, and counterbalances, enabling lower maintenance and cleanup costs and prolonging press life. A modified flanged slide gives larger die area. Furnished in flywheel or gear type, the press is inclined manually by a double-screw arrangement. An air friction clutch and brake provides overload control and controlled cycling and inching. (The Minster Machine Co.)

For more data circle No. 50 on postcard, p. 155

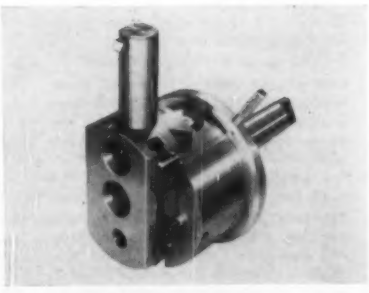
Forked Gage Head Simplifies ID Grinding



Fork shape of an air-gaging head keeps it inside work without interfering with reciprocating wheel travel. Thus, measuring is not limited to brief intervals, as with the conventional plug. Set 0.017 in. under finish size, it has greater approach range, providing greater accuracy to both gage and machine. Controlling fast grinding to 0.0005 in. oversize, the gage commands wheel retraction and dressing, followed by accurate finishing and retraction again when finish size is reached. With this system, one man can tend several machines. (Federal Products Corp.)

For more data circle No. 51 on postcard, p. 155

Facing and Boring Heads Have Radial Tool Feed



Three sizes of facing and boring heads provide any rotating-spindle machine with uninterrupted radial tool feed. Designed for boring, facing, turning, counterboring, backfacing, grooving, and chamfering, they cover diameters from 7/16 to 25 in. Different shanks and adapters permit spindle or sleeve mounting. Bars holding tools can be set horizontal or vertical in the dovetail slide. Radial feed rate is adjustable, and feed stops are provided. (Davis Boring Tool Div., Giddings & Lewis Machine Tool Co.)

For more data circle No. 52 on postcard, p. 155

Crab-Like Truck Travels in Any Direction

A forklift truck capable of crablike travel in any direction and equipped with special controls offers an answer to unusual material-handling problems. A separate control lever permits turning in either direction, and almost within the truck's own length. Thus loads of all types can easily be maneuvered into confined areas. Long loads can be carried across the forks, sideways down aisles. It is also possible to swing the load 30° either side of center, facilitating final placement. Narrow width permits easy operation in pallet rows. (Automatic Transportation Co.)

For more data circle No. 53 on postcard, p. 155

NEW EQUIPMENT

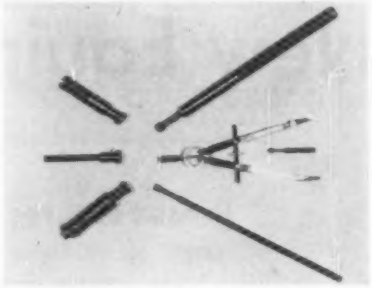
Laboratory Furnace

A resistance furnace for laboratory use operates to 5000°F using an inert gas for interior atmosphere with a graphite heating element and carbon insulation. The standard heating chamber is 4 in. in diam by 8 in. high, variable upon specific order. Sighting tubes allow sighting for temperature readings and automatic control purposes. A self-contained unit, the furnace is available with or without automatic temperature controls. (Curtiss-Wright Corp., Santa Barbara Div.)

For more data circle No. 54 on postcard, p. 155

Portable Broaches

Portable broaching, widely used by airframe manufacturers, is a method of broaching small holes in sheet metal with small broaches in hand-held tools. It produces holes free from radial lines, facilitates irregular-shaped holes, and consistently obtains exacting tolerances with long tool life. A new series of 28 portable broaches incorporate



a segmented helical pattern of cutting teeth to generate the full diametral cut, followed by a series of closely pitched teeth to produce a fine surface finish of diameters from 0.250 to 0.6562 in. (California Broach Co.)

For more data circle No. 55 on postcard, p. 155

Carbide Coater

Now available in the U.S.A. at low cost, the Wickman Impregnator applies either a coarse or a fine layer of carbide to the surface of high-speed-steel tools, increasing tool life from 200 to 1000 pct. A sparking action causes carbide to penetrate the surface of the tool,

depositing a very thin but effective layer to decrease abrasive wear. Applicable to all tools, carbide is applied with any one of three different tip shapes, depending on the particular use. (The OK Tool Co., Inc.)

For more data circle No. 56 on postcard, p. 155

Ultrasonic Cleaner

A low-cost ultrasonic cleaning unit can handle two different jobs

WEBB PLATE FABRICATING MACHINERY

Steelworkers ALL STEEL CONSTRUCTION

DELIVERY 10 DAYS

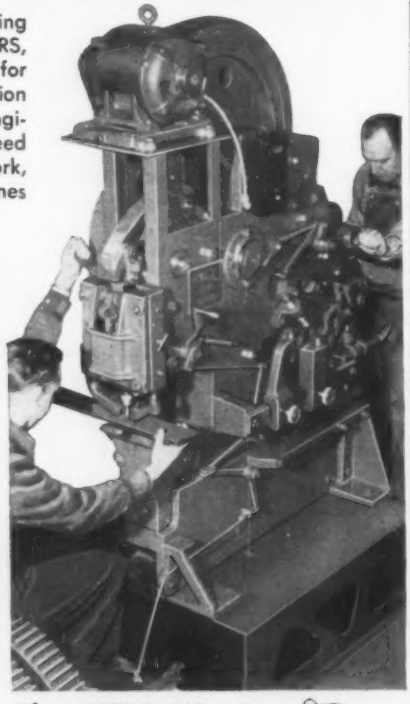
The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.

Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structurals.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. E.



Let Speed PAY–The WEBB Way!

SLIP ROLLS

PYRAMID TYPE ROLL

INITIAL TYPE ROLL

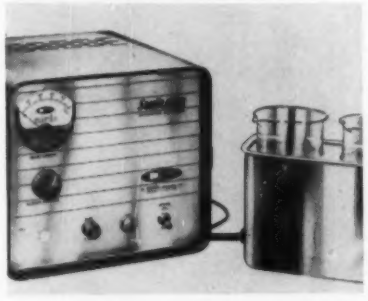
STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

Since 1881 THE WEBB CORP.

WEBB CITY, MO., U. S. A.

at the same time. It agitates the contents of two glass beakers. It is thus possible to wash and rinse parts at the same time, use two different solutions, use any chemical



solvent in the beakers, or use the stainless-steel tank without beakers. Easy to operate, it uses no more power than a light bulb. (The Narda Ultrasonics Corp.)

For more data circle No. 57 on postcard, p. 155

Conveyor Pans, Pallets

A clevis-pin attachment which bolts directly to the vertical axles of one make of chainless conveyor permits pans or pallets to move ma-

terials over long distances without need for transfer points, and to negotiate any curve or incline with ease. (The American MonoRail Co.)

For more data circle No. 58 on postcard, p. 155

Goblet Buffs

A goblet-shaped buff for metal finishing adapts easily to irregular surfaces, and is recommended for swaged or curved surfaces, such as those in stainless-steel sinks. It is made of wool fibers. Using liquid or solid compounds, it runs cool and does not spray compound off the work surface. Well balanced and uniform, it is well suited to automatic polishing equipment. (Schlegel Mfg. Co.)

For more data circle No. 59 on postcard, p. 155

450-Ton Diecaster

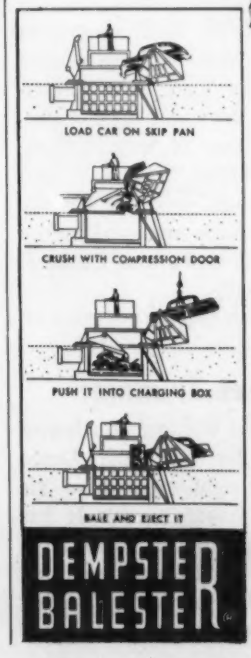
An aluminum diecasting machine offers very large die opening, delivers 450 tons of clamp, and provides a die opening stroke adjustable from 8 to 30 in. It will produce deep-draw aluminum parts weighing up to 16 lb. A standard injection system provides high initial speed with high final impact, producing super-dense diecastings with fine surface finish. (Lester-Phoenix, Inc.)

For more data circle No. 60 on postcard, p. 155

Pressure Blowers

A series of high-efficiency, high-capacity pressure blowers with airfoil blading offers capacities from 8000 to 64,000 cfm at pressures from ¾ to 2¼ psig. Well suited for steel-mill furnaces and other

New Power Packed "750 CS" Bales Car Bodies in Just 3 Minutes



LOW-INVESTMENT BALESTER DOES WORK OF BIGGER PRESSES

In a feast-or-famine market, versatile equipment pays off! That's the reason for the new 750-CS which handles smaller scrap with unbeatable efficiency and bales car bodies at a pace only slightly off that of the big expensive presses. The powerful new "Ram-Pan Loader" with the curved bottom fits the arc of the compression door as it pushes the car down into the charging box, a pre-baling operation that takes less than a minute and reduces costly cutting or shearing work. All told, you've got a tight compact bale in *less than three minutes!* You'll like the many other new features of the 750-CS.

Mfd. By DEMPSTER BROTHERS, Inc.

WRITE TODAY FOR NEW BULLETIN ON 750-CS

DEMPSTER BROTHERS, Dept. 1A-8
Knoxville 17, Tenn.

SELF-CONTAINED SLITTERS

YODER SLITTERS

basic equipment for cost-conscious users of strip!

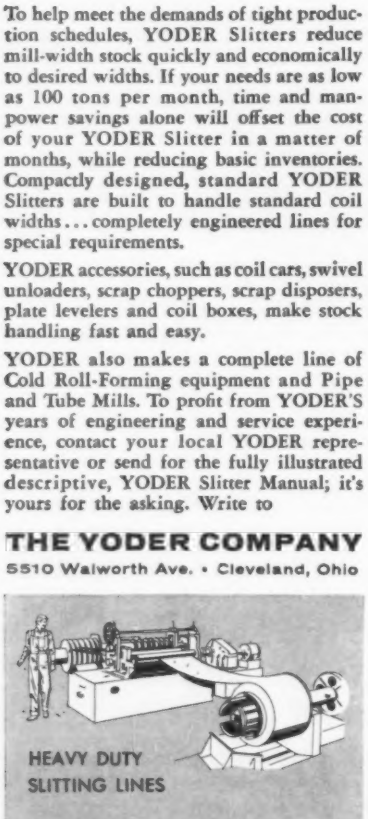
To help meet the demands of tight production schedules, YODER Slitters reduce mill-width stock quickly and economically to desired widths. If your needs are as low as 100 tons per month, time and manpower savings alone will offset the cost of your YODER Slitter in a matter of months, while reducing basic inventories. Compactly designed, standard YODER Slitters are built to handle standard coil widths... completely engineered lines for special requirements.

YODER accessories, such as coil cars, swivel unloaders, scrap choppers, scrap disposers, plate levelers and coil boxes, make stock handling fast and easy.

YODER also makes a complete line of Cold Roll-Forming equipment and Pipe and Tube Mills. To profit from YODER'S years of engineering and service experience, contact your local YODER representative or send for the fully illustrated descriptive, YODER Slitter Manual; it's yours for the asking. Write to

THE YODER COMPANY

5510 Walworth Ave. • Cleveland, Ohio



NEW EQUIPMENT

industrial applications, they operate quietly and give optimum performance with minimum power input. (Westinghouse Electric Corp.)

For more data circle No. 61 on postcard, p. 155

Welders' Clothing

Soft leather jackets, sleeves, and bibs, light and flexible, protect welders' arms, chests, and shoulders from harmful heat rays. The bib attaches with snap fasteners. (American Optical Co.)

For more data circle No. 62 on postcard, p. 155

Wheel Dresser

Equipped with a replaceable diamond, a small wheel dresser dresses

and trues plate-mounted and pedestal-type grinding wheels. (Last Word Sales Co.)

For more data circle No. 63 on postcard, p. 155

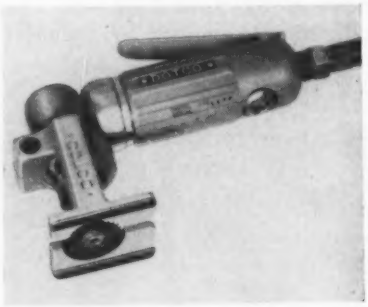
Crane Chain Release

A solenoid chain release provides extreme safety in crane operations where it is dangerous for a worker to unhook the load. Remote-controlled from the crane cab, it permits safe release of tough-to-handle loads without assistance. For safety, all loads must be on the floor with tension removed before it will operate. (American Chain & Cable Co., Inc.)

For more data circle No. 64 on postcard, p. 155

Blind Rivet Trimmer

A blind rivet trimmer attachment is designed for use with Dotco Model 1AE right-angle drive air tools (same manufacturer). It has many new advantages. The large guide surface insures square cutting by the circular saw cutter, saving time in the subsequent shaving operation. Light in weight and easy to use, it can be used on universal-type or countersunk-type rivets, or



similar fasteners. (Doeden Tool Corp.)

For more data circle No. 65 on postcard, p. 155

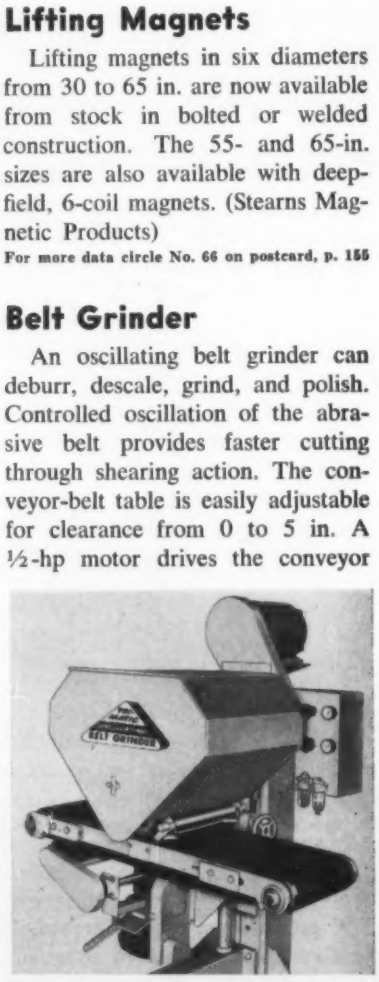
Lifting Magnets

Lifting magnets in six diameters from 30 to 65 in. are now available from stock in bolted or welded construction. The 55- and 65-in. sizes are also available with deep-field, 6-coil magnets. (Stearns Magnetic Products)

For more data circle No. 66 on postcard, p. 155

Belt Grinder

An oscillating belt grinder can deburr, descale, grind, and polish. Controlled oscillation of the abrasive belt provides faster cutting through shearing action. The conveyor-belt table is easily adjustable for clearance from 0 to 5 in. A ½-hp motor drives the conveyor



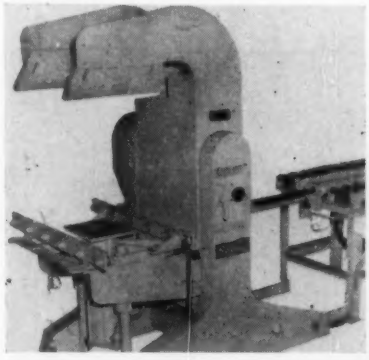
from 60 to 120 ipm. A 5-hp motor drives the work-belt at 5000 sfpm. (Sales Service Mfg. Co.)

For more data circle No. 67 on postcard, p. 155

Core Rollover Machines

Three new core rollover ma-

chines have capacities from 500 to 1000 lb. They feature a 7-to-10-second overall cycle, simplified control, improved cushioning, and roll-



ing of core boxes in or out in any selected combination of 90 or 180 degrees. (Beardsley & Piper)

For more data circle No. 68 on postcard, p. 155

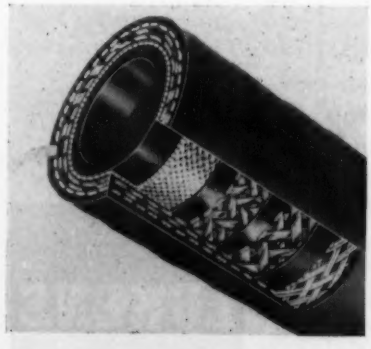
Floating Tool Holders

A line of floating tool holders, to compensate for spindle misalignment in making setups and insure accurately machined parts, includes all sizes and types, with straight Morse and taper shanks, and tap holders. Providing positive drive, they employ only four main parts. The shock absorber is neoprene rubber. (Burgmaster Corp.)

For more data circle No. 69 on postcard, p. 155

Strong Steam Hose

All steam operations in mines, foundries, mills, etc., can be made safer with a new type of steam hose featuring braided-steel-wire burst protection. It is designed for use to



200 psi saturated steam pressure at 388°F. It is available in ½- to 2-in. sizes. (Raybestos - Manhattan, Inc., Manhattan Rubber Div.)

For more data circle No. 70 on postcard, p. 155

It's a fact...

HEAVY-DUTY ENGINES IN ALLIS-CHALMERS LIFT TRUCKS

SAVE YOU MORE
MAKE YOU MORE

The heavy-duty industrial engines in Allis-Chalmers lift trucks stand alone in their ability to take tough work for long periods. The fact that they are the most rugged used in lift trucks means thousands of extra work hours, minimum maintenance, more years of service.

The fact that they deliver more usable horsepower means they do extra work every hour — maneuver faster, climb steeper grades. An Allis-Chalmers 2,000-lb truck, for instance, climbs a 40-percent grade loaded — other makes in the same class climb grades of only 18 to 28 percent.

Does the engine make a difference? Just listen to these users.

"They're brutes for punishment," comments a spokesman for a Michigan firm. "We formerly replaced an engine a year — haven't replaced any in the Allis-Chalmers trucks in over three years of operation."

No major engine overhaul under 10,500 operating hours for the 19 Allis-Chalmers trucks at a New York establishment. "We actually overhauled the first engine as an experiment — we wanted to know what made it tick for 10,500 working hours."

"They use less fuel than other trucks do," says a chief mechanic in Wisconsin. "Allis-Chalmers lift trucks also are tougher than others and require less maintenance."

Put an Allis-Chalmers lift truck to work and you will see many advantages of its heavy-duty engine *immediately*. But it will take years to reveal *all* the benefits. Let your dealer give you more facts — and a demonstration. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

BH-120

Now the nation's third largest steel plate producer

The men who guide Lukens purchasing activities are, left to right, Edmund Pfeifer, Director of Purchases; E. Clair Book, Purchasing Consultant; and Albert W. Gudal, Purchasing Agent.

LUKENS SALUTES ITS PURCHASING MEN

. . . for their important contribution to the company's growth. Purchasing is one of modern management's most valued skills. Lukens knows this well, for it has aided our progress consistently in recent years—especially during our "Phase A" expansion program which raised us to third position among steel plate producers. Lukens' experienced purchasing team worked closely with contractors to achieve on-time completion of this project, and is now geared to more critical procurement demands than ever.

Our customers can now look forward to a growing supply of carbon and alloy steel plate, plate shapes, heads, weldments . . . Lukens "T-1," "Nine Nickel" and clad steels. In addition to greater capacity, the new facilities will provide even better steel plate quality.

Careful, competent purchasing was essential to the realization of "Phase A" objectives: *new capacity and quality levels to meet the growing demands of our plate fabricating customers.* Lukens Steel Company, Coatesville, Pa.

NEW CAPACITY ~ NEW QUALITY

LUKENS

SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE

The Iron Age Summary

New Inventory Policies Studied

Many users are determined to let the mills carry their inventory burden after strike's end.

It's a policy that has been tried before, but circumstances may be different now.

▪ In the midst of the current steel strike, users and producers are doing some long thinking about post-strike inventory policies.

The thinking of many is that steel inventories are not likely to revert to the peak-and-valley cycle of recent years. Instead, many of the big users, with automotive in the lead, indicate they will operate with low inventories after the strike is settled.

Heard It Before—This is no new idea to the industry. It has heard it before. And it has also seen this determination to hold steel stocks down wilt as soon as supplies were threatened. However, this time it may be different.

Principal reason is that big users have confidence that the new capacity of the steel industry is much more flexible and can provide fast mill service for any emergency. They are going to make every attempt to get the steel industry to carry the burden of stocking steel.

Strike Ended It—A big step in this direction was made earlier this year, when the big users (again largely automotive) were able to operate on low inventories. But this policy succumbed in a hurry when it became evident that the steel negotiations were headed for trouble.

Then, the biggest inventory buildup in years took place. Companies with the strictest inventory policies became most insistent demanders of early delivery to beat the strike.

This brought out a major development on each side of the issue:

First, a strike threat or national emergency makes strict inventory control an academic point.

But, secondly, the steel industry was able to aid and abet the buildup without operating at over 95 pct capacity. This, in itself, shows the industry's ability to produce, and creates an argument for the low inventory advocates.

Significance — If low inventory thinking prevails, it could mean two things. One, in a good auto year or any period of sudden increase in steel demand, small users can be hurt. Another, if the steel strike ends Sept. 1 or sooner, fourth quarter operations may go no higher than 90 pct.

But, as now appears likely, an extended steel strike would throw out this line of reasoning. The strike's end would bring on a steel buying spree that will force the operating rate as high as the mills can, or are willing, to let it go.

Users may be underestimating the effects of the strike. It will take much longer for the mills to begin deliveries than most believe. If the strike goes eight weeks, four weeks will be added before shipments reach sizable proportions.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 332	Last Week 332	Month Ago 367	Year Ago 1,690
Ingot Index (1947-1949=100)	20.7	20.7	22.9	105.2
Operating Rates				
Chicago	5.0	5.0	5.0	76.0
Pittsburgh	3.0	3.0	3.0	54.5
Philadelphia	12.0	12.0	15.0	71.5
Valley	10.0	10.0	10.0	49.0
West	0.0	0.0	0.0	72.5
Cleveland	0.0	0.0	0.0	53.0
Detroit	23.0	25.0*	23.0	69.0
Buffalo	0.0	0.0	0.0	46.0
South Ohio River	59.0	57.0*	78.0	72.0
South	12.0	12.5	11.0	52.0
Upper Ohio River	51.5	50.0*	51.0	82.5
St. Louis	86.0	83.0	80.0	74.0
Aggregate	12.0	12.0	13.0	62.6

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.49
Scrap No. 1 hvy (Gross ton)	$39.83	$39.83	$39.50	$41.83
No. 2 bundles	$27.50	$27.50	$27.00	$29.50
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.80
Copper, electrolytic	30.00	30.00	30.00	26.50
Lead, St. Louis	11.80	11.80	11.80	10.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.50	102.00	102.00	95.25
Zinc, E. St. Louis	11.00	11.00	11.00	10.00

Is the Price Spiral Ending?

Thomas O. English, general purchasing agent for Alcoa, finds hope the postwar price spiral may be ending.

For buyers, he foresees a period of plentiful supply, reasonable prices, and good deliveries.

▪ "With the exception of steel, this is an ideal buying period," says Tom English, general purchasing agent for Aluminum Co. of America and president of the National Association of Purchasing Agents.

Apart from this one trouble spot, Mr. English sees plentiful supply, reasonable prices, and good delivery.

What Index Shows—The price picture shows up clearly in Alcoa's purchasing index. Over the past 10 years prices of the things the company buys have jumped 40 pct on the average. The interesting thing is that virtually all of this increase came in the years before 1957.

For the past three years Alcoa buying prices have shown remarkable stability. There was a small hike in 1957. Prices were held down during last year's slump. The 1959 recovery has brought no general price rise so far.

Steel Buildup — Mr. English is hopeful these facts may indicate an end to the postwar inflationary spiral. However, his figures from 1955 show that prosperity can bring a sharp price surge. In terms of recent trends, it is certainly true that prices are reasonable.

Alcoa's experience on steel inventories may be typical of many companies, Mr. English feels. Alcoa set out to build 90 days' supply of steel (the company spends around $20 million a year on purchases of all metals). Orders for steel were beefed up but the aluminum business improved at the same time. Net effect was to shave the planned stockpile by about 15 days. The steel strike had not gone a week before thin spots began to appear in steel inventories. (For story on the nation's inventory position now, see p. 91.)

On inventories and on all supply questions, Mr. English speaks from a background of 22 years in Alcoa purchasing. He is in close contact with buyers all over the country.

What's Bought—Moreover, he holds key responsibility in a purchasing operation that is both big and broad. In an average recent year, Alcoa spent $200 million on purchases. Electrical equipment took $49 million; construction, $60 million; fabricating machinery, $16 million; raw materials, $26 million.

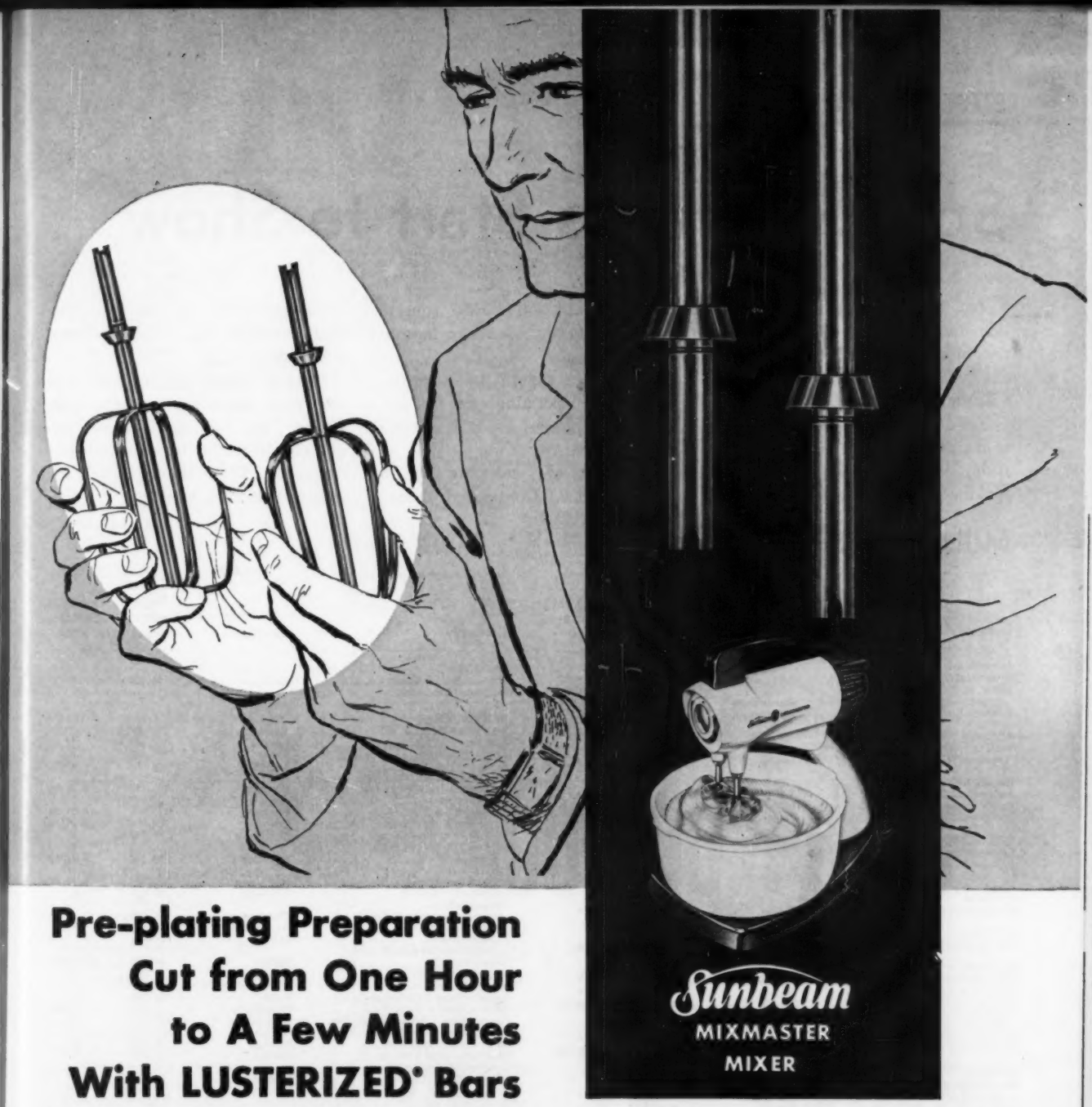
. . . And How—According to Mr. English, Alcoa has no rigid policy on central or plant buying.

"We're very flexible," he says. "If conditions change we're set up to work one way or the other."

The central group is staffed with skilled specialists in chemical, electrical and other fields. Heavy capital equipment is normally bought centrally because of the specialized knowledge required.

If savings are great enough, requirements of common items may be consolidated for central purchasing. This is done in the case of files and lumber. However, plants in lumber centers buy locally.

THOMAS O. ENGLISH: Try to keep buying flexible



Pre-plating Preparation Cut from One Hour to A Few Minutes With LUSTERIZED® Bars

For as long as many can remember, the trademark Mixmaster has been the symbol of a quality, dependable household mixer. The pioneer producer of this type of popular kitchen appliance, Sunbeam has always insisted on the best materials and meticulous workmanship.

No little attention is given to attaining the highest quality chrome plating on the beater shafts, for example. The chrome must be smooth, free of pits where food might accumulate, and remain bright over years of hard use. To accomplish this, burnishing the cold finished steel bars formerly used for one hour was necessary in order to bring the bars up to the pre-plating brightness and smoothness required.

This expensive, time-consuming operation has been reduced to only a few minutes since Bliss & Laughlin's Lusterized cold finished steel bars have been used. That's because dulling, gritty processing contaminants, oils and lime are removed at the mill by Bliss & Laughlin's exclusive, patented finishing process. The close tolerances characteristic of Bliss & Laughlin production enable Sunbeam to count on a consistently tight fit of the shafts at the beater bearings, which minimizes vibration.

Ask us to show you how your production can benefit from the tangible quality and cost-saving advantages of specifying "Bliss & Laughlin Lusterized Finish"—the big difference in cold finished steel bars. Standard prices apply!

Originators of LUSTERIZED® Finish—The BIG DIFFERENCE in Cold Drawn Steel Bars

BLISS & LAUGHLIN

GENERAL OFFICES: Harvey, Ill. • PLANTS: Harvey, Detroit, Buffalo, Mansfield, Mass.

Largest Independent Producer of Cold Finished Steel Bars

Spot Shortages Start to Show

■ The steel strike cut July production roughly in half. Production for the month dropped to 5,233,000 net tons from the record 10,907,-634 tons in June.

Total industry output, according to the American Iron and Steel Institute, reached 69,511,203 tons for the first seven months. This compared with 44,172,892 tons in the recession-hit first seven months of 1958.

Meanwhile, the 15 pct of the industry now operating (see list, below) is turning out about 1,330,000 tons a month.

Shortages are cropping up in these products: Cold-rolled sheets, structurals (but particularly wide-flange beams), galvanized sheets, and plate.

Overall, inventories are still high and most users are set into September. But spot shortages are beginning to show up with greater frequency. These shortages will increase with each week.

Mills Now Operating

Company	Location	Ingot Capacity (tons)	Contract Expiration
ALABAMA			
Kilby Steel Co.	Anniston	34,020	*
Porter, H. K., Co., Inc.			
Connors Steel Div.	Birmingham	115,000	9/1/59
Southern Electric Steel Co.	Birmingham	66,000	8/31/59
ARIZONA			
Yuba Consolidated Industries, Inc.			
Western Rolling Mills Div.	Helena	60,000	*
CALIFORNIA			
Armco Steel Corp.	Torrance	50,000	*
Pacific States Steel Corp.	Niles	216,000	E
Southwest Steel Rolling Mills, Inc.	Los Angeles	45,000	E
CONNECTICUT			
Carpenter Steel Co.			
Carpenter Steel of New England, Inc.	Bridgeport	84,000	E
FLORIDA			
Florida Steel Corp.	Tampa	43,000	*
GEORGIA			
Atlantic Steel Co.	Atlanta	400,000	E
ILLINOIS			
Columbia Tool Steel Co.	Chicago Hgts.	6,600	*
Finkl, A., & Sons Co.	Chicago	33,600	*
Granite City Steel Co.	Granite City	1,440,000	E
International Harvester Co.			
Wisconsin Steel Works	S. Chicago	1,200,000	*
Keystone Steel and Wire Co.	Peoria	475,000	*
Laclede Steel Co.	Alton	600,000	8/31/59
INDIANA			
Borg-Warner Corp.			
Ingersoll Steel Div.	New Castle	84,000	*
Continental Steel Corp.	Kokomo	420,000	E
Joslyn Mfg. & Supply Co.	Chicago	37,500	E
KENTUCKY			
Jessop Steel Co.			
Green River Steel Corp.	Owensboro	183,190	E
MARYLAND			
Eastern Stainless Steel	Baltimore	80,000	E
MICHIGAN			
Allegheny Ludlum Steel Corp.	Ferndale	3,000	*
Ford Motor Co.	Dearborn	1,898,600	*
MISSISSIPPI			
Mississippi Steel Corp.	Flowood	45,000	*
NEW YORK			
Simonds Saw & Steel Co.	Lockport	21,600	8/31/59
Wickwire Bros., Inc.	Cortland	32,440	10/1/59
OHIO			
American Compressed Steel Corp.	Cincinnati	21,600	*
Armco Steel Corp.	Middletown	2,657,000	*
Copperweld Steel Co.	Warren	660,000	E
Detroit Steel Corp.	Portsmouth	1,500,000	E
Republic Industrial Corp.			
Industrial Forge & Steel, Inc.	Canton	84,000	8/31/59
Timken Roller Bearing Co.	Canton	700,000	8/24/59
Universal-Cyclops Steel Corp.			
Empire-Reeves Steel Corp.	Mansfield	600,000	8/31/59
OREGON			
Gilmore Steel & Supply Co., Inc. (Oregon Steel Mills)	Portland	150,000	E
PENNSYLVANIA			
Alan Wood Steel Co.	Conshohocken	600,000	**
Alco Products, Inc.	Latrobe	108,650	**
Armco Steel Corp.	Butler	857,000	*
Braeburn Steel Corp.	Tarentum	20,500	E
Baldwin-Lima-Hamilton Corp.			
Standard Steel Works Div.	Burnham	188,710	8/31/59
Carpenter Steel Co.	Reading	87,500	*
Edgewater Steel Co.	Oakmont	117,600	8/31/59
Erie Forge & Steel Corp.	Erie	284,000	8/31/59
Firth Sterling Steel Corp.	McKeesport	20,040	E
General Tire & Rubber Co.			E
Byers, A. M., Co.	Ambridge	90,000	8/31/59
Harsco Corp.			
Harrisburg Steel Co. Div.	Harrisburg	100,760	11/15/59
Heppenstall Co.	Pittsburgh	55,550	E
Heppenstall Co.			
Midvale-Heppenstall Co.	Philadelphia	157,700	*
Jessop Steel Co.	Washington	35,800	E
Latrobe Steel Co.	Latrobe	24,000	**
Merritt-Chapman & Scott Corp.			
Milton Steel Div.	Milton	90,000	11/30/59
Mesta Machine Co.	New Castle	66,000	*
Mesta Machine Co.	W. Homestead	165,000	*
National Forge & Ordnance Co.	Irvine	25,000	*
Pencoyd Steel & Forge Corp.	Philadelphia	15,600	8/10/60
Phoenix Steel Tube and Struct. Div.	Phoenixville	360,000	**
Phoenix Steel Plate Div.	Harrisburg	486,750	**
Union Electric Steel Corp.	Carnegie	25,000	E
Vanadium-Alloys Steel Co.	Latrobe	12,000	*
Vanadium-Alloys Steel Co.			
Colonial Steel Co. Div.	Monaca	30,000	**
RHODE ISLAND			
Washburn Wire Co.	Phillipsdale	93,000	10/15/59
TENNESSEE			
Knoxville Iron Co.	Knoxville	38,000	*
TEXAS			
Godfrey L. Cabot, Inc.			
Cabot Shops, Inc.	Pampa	16,200	*
Cameron Iron Works, Inc.	Houston	58,800	*
LeTourneau, R. G., Inc.	Longview	90,000	*
Lone Star Steel Co.	Lone Star (Daingerfield)	800,000	9/7/59
Texas Steel Co.	Ft. Worth	132,450	*
VIRGINIA			
Newport News Shipbuilding & Dry Dock Co.	Newport News	15,000	*
Roanoke Electric Steel Corp.	Roanoke	25,000	*
WASHINGTON			
Isaacson Iron Works, Inc.	Seattle	102,000	*
WEST VIRGINIA			
National Steel Corp.			
Weirton Steel Div.	Weirton	3,330,000	*
Porter, H. K. Co., Inc.	Huntington	110,000	4/30/60

E = Contract extended.
* = Not organized by USWA.
** = 30 days after U. S. Steel Agreement.

COMPARISON OF PRICES

(Effective Aug. 18, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Aug. 18 1959	Aug. 11 1959	July 21 1959	Aug. 19 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.32
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bars	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.188¢

	Aug. 18 1959	Aug. 11 1959	July 21 1959	Aug. 19 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.97
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.47
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.49
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.50	$43.50	$43.50	$44.50
No. 1 steel, Phila. area	39.50	39.50	39.50	37.50
No. 1 steel, Chicago	36.50	36.50	35.50	43.50
No. 1 bundles, Detroit	37.50	37.50	37.50	37.50
Low phos., Youngstown	45.50*	44.50	44.50	46.50
No. 1 mach'y cast, Pittsburgh	52.50	52.50	51.50	51.50
No. 1 mach'y cast, Phila.	50.50	50.50	49.50	49.50
No. 1 mach'y cast, Chicago	59.50	59.50	59.50	53.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$39.83	$39.83	$39.50	$41.83
No. 2 bundles	27.50	27.50	27.00	29.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	$14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00	30.00	26.50
Copper, Lake, Conn.	30.00	30.00	30.00	26.50
Tin, Straits, N. Y.	102.50†	102.00	102.00	95.25
Zinc, East St. Louis	11.00	11.00	11.00	10.00
Lead, St. Louis	11.80	11.80	11.80	10.80
Aluminum, virgin ingo.	26.80	26.80	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Market Puts Hopes On Fall Demand

The prospect of a strong demand for scrap after the steel strike is a lure for speculators.

And the continued demand for export scrap in Coast areas provides additional support.

■ There are more signs of strength than weakness showing up in the market, despite the fact that the steel strike is well into its fifth week without signs of a settlement.

Dealer reluctance to sell is still the main prop under prices as the urge to speculate becomes stronger. A seasonal drop in scrap generation in many areas, coupled with the prospect of a strong post-strike demand for scrap, has dealers holding on to as much scrap as possible.

Coast markets continue to enjoy a strong export demand, further bolstering price levels in these areas.

Pittsburgh—The market here is growing stronger. There is no new activity to peg price levels, but the talk is all of firm prices. On a late railroad list, heavy tonnages were sold with no significant price reductions and with increases in some grades. Some scrap has moved out of Pittsburgh and the district faces growing competition in its outside supply areas. No one knows for sure, but scrap men feel the odds in favor of a strong future market are lengthening as the steel strike drags on.

Chicago—Market continues very strong with dealers holding or advancing their asking prices. New electric furnace prices are advancing. Railroad grades continue very strong. An offer of $44 for factory bundles was refused, the owner preferring to hold out for higher prices at the end of the strike.

Philadelphia—The local market is still very firm, with RR specialties up $1. While domestic consumption is low, the export business is brisk. Some trade sources predict that the June-September period will set scrap export records for the port.

New York—Export continues to bolster steelmaking prices here, and there are rumors of even more extensive export buying. Stainless also continues firm with expectations of export orders helping. Pipe foundries are still taking cast at going prices. Blast furnace prices are nominal but the trade insists it couldn't fill any orders under present quotations.

Detroit—A general attitude of "marking time" prevails in this area. There's virtually no change in the market because of so very little trading activity. It's a dull situation to live through, say the brokers. Some dealers forecast a creeping softness in the market, which may become more noticeable in September. Lone price change this week was a $1 decline in machine shop turnings.

Cleveland—Valley market went up $1 on prime steelmaking grades as a mill placed one of the largest single tonnage orders of the year for post - strike delivery. Prime dealer grades brought $45 and No. 2 heavy melting jumped to $38, indicating a shortage of good dealer material. Although only a paper transaction so far, the move indicates steelmakers are lining up material for a post - strike rush.

St. Louis—Cast iron grades are strong in this area while most other prices hold unchanged. Heavy breakable cast and cast iron car wheels tacked on gains of $2. Stove plate is up $1, angle and splice bars are up $2. Cast iron brake shoes are being dropped from quotation due to lack of demand.

Cincinnati — Market is coasting along, living off foundry business and scant river shipments. Prime price is up $1 on appraisal as dealers are still holding off sending to area mills at offered prices. A post-strike rush is also in the making here with both auto and railroad list tonnage down because of model changeover and layoffs.

Birmingham—The scrap market here remains strong and active, with dealers reporting shortages of some items and little coming into the yards. Some companies were reported paying prices above quotations on special deals for hard-to-get items while still apparently trying to hold prices down. Electric furnaces are still receiving shipments on first-of-month orders.

Buffalo — Inactivity continues here as a result of the steel strike. Some dealers expect a strong market to emerge when the strike ends. Meanwhile, dealers are keeping busy preparing what little scrap that trickles in.

Boston—On better sentiment in the market, prices of primary grades moved up $1. There is some export, but the stronger market is based on the assumption that the strike's end will bring a major upward price trend.

West Coast — Market remains stagnant, prices firm. Export activity is taking up the slack caused by the strike.

Houston—The market retains its firmness despite absence of the district mill from the market. The strength stems from the brisk export activity. Intake has improved some because of the good export market.

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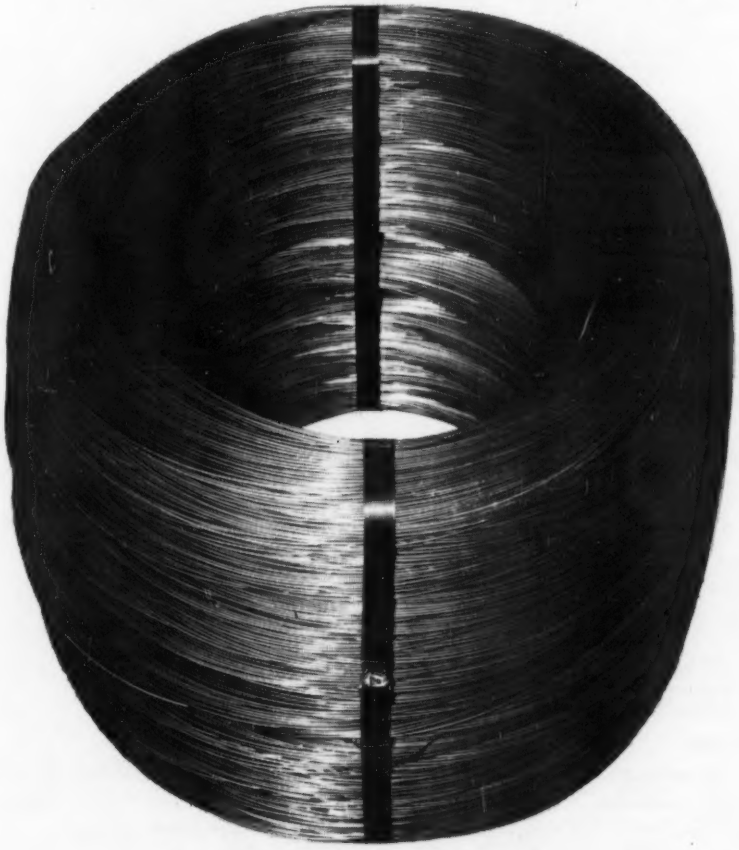

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SCRAP PRICES *(Effective Aug. 18, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	47.00 to 48.00
Heavy turnings	35.00 to 36.00
No. 1 RR hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	58.00 to 59.00
RR specialties	53.00 to 54.00
No. 1 machinery cast.	52.00 to 53.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	44.00 to 45.00
Stainless	
18-8 bundles and solids	230.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	50.00 to 51.00
Low phos. punch'gs plate, ¼ in. and heavier	48.00 to 49.00
Low phos. 2 ft and under	46.00 to 47.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	51.00 to 52.00
Rerolling rails	61.00 to 62.00
Rails 2 ft and under	57.00 to 58.00
Angles and splice bars	52.00 to 53.00
RR steel car axles	66.00 to 67.00
RR couplers and knuckles	50.00 to 51.00
No. 1 machinery cast.	59.00 to 60.00
Cupola cast.	52.00 to 53.00
Cast iron wheels	44.00 to 45.00
Malleable	60.00 to 61.00
Stove plate	50.00 to 51.00
Steel car wheels	49.00 to 50.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	115.00 to 120.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	19.00 to 20.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	23.00 to 24.00
Clean cast. chem. borings	27.00 to 28.00
Low phos. 5 ft and under	43.00 to 44.00
Low phos. 2 ft punch'gs	44.00 to 45.00
Elec. furnace bundles	41.00 to 42.00
Heavy turnings	33.00 to 34.00
RR specialties	45.00 to 46.00
Rails 18 in. and under	59.00 to 60.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	44.00 to 45.00
Cast iron car wheels	45.00 to 46.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	50.00 to 51.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.50 to $36.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	34.50 to 35.50
No. 2 bundles	22.50 to 23.50
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. and under	45.00 to 46.00
Rails, random length	48.00 to 49.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	43.00 to 44.00
Drop broken cast.	53.00 to 54.00

Youngstown

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	27.50 to 28.50
Machine shop turn.	18.50 to 19.50
Shoveling turnings	23.50 to 24.50
Low phos. plate	45.00 to 46.00

Cleveland

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	40.50 to 41.50
No. 1 factory bundles	44.50 to 45.50
No. 2 bundles	24.00 to 25.00
No. 1 busheling	40.50 to 41.50
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Cut structural & plates, 2 ft & under	46.00 to 47.00
Drop forge flashings	40.50 to 41.50
Low phos. punch'gs plate	41.50 to 42.50
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails 2 ft and under	57.00 to 58.00
Rails 18 in. and under	58.00 to 59.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	56.00 to 57.00
No. 1 machinery cast.	54.00 to 55.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	115.00 to 120.00
430 bundles	115.00 to 120.00

Buffalo

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 busheling	33.00 to 34.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	19.00 to 20.00
No. 1 RR hvy. melting	40.00 to 41.00
Rails, random lengths	46.00 to 47.00
Rails, 18 in. and under	51.00 to 52.00
Angles and splice bars	47.00 to 48.00
RR specialties	46.00 to 47.00
Cupola cast.	54.00 to 55.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	46.00 to 47.00
Cast iron car wheels	42.00 to 43.00
Rerolling rails	58.00 to 59.00
Unstripped motor blocks	41.00 to 42.00

Birmingham

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 special bundles	38.00 to 39.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft.	43.00 to 44.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	44.00 to 45.00
Rerolling rails	57.00 to 58.00
No. 1 cupola cast.	55.00 to 56.00
Stove plate	55.00 to 56.00
Cast iron car wheels	43.00 to 44.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 dealer bundles	20.00 to 21.00
Machine shop turnings	8.00 to 9.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 prepared solids	195.00 to 200.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	35.00 to 36.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	36.00 to 37.00
Mixed cupola cast.	44.00 to 45.00
Automotive cast.	50.00 to 51.00
Stainless	
18-8 bundles and solids	190.00 to 200.00
18-8 turnings	80.00 to 90.00
430 bundles and solids	85.00 to 95.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	8.50 to 9.00
Shoveling turnings	11.50 to 12.50
Clean cast. chem. borings	16.50 to 17.00
No. 1 machinery cast.	35.00 to 36.00
Mixed cupola cast.	36.00 to 37.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	33.00
No. 1 dealer bundles	33.00
No. 2 bundles	22.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$38.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	33.00
No. 2 bundles	$18.00 to 20.00
Machine shop turn.	16.00
Shoveling turnings	18.00
Cast iron borings	18.00
Elec. furn. 1 ft and under (foundry)	$47.00 to 48.00
No. 1 cupola cast.	45.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

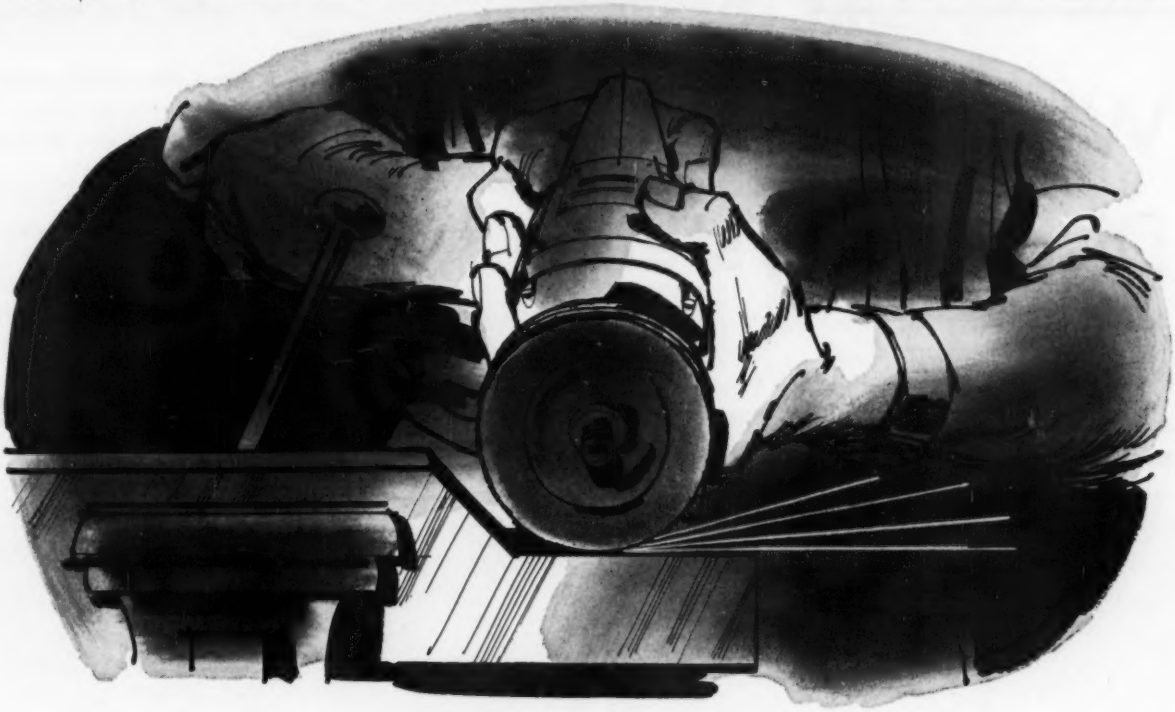
No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	21.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	38.50 to 39.50
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	38.00 to 39.00

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



In diffused daylight, so that spark characteristics can be accurately observed, hold a sample against a clean grinding wheel revolving at high speed. If the material gives off only a few very short orange lines, it is probably Stellite. It is well to have a sample of known analysis for comparison.

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What's Best Surplus Disposal System?

Opinion is divided on best method of handling surplus copper and aluminum in the government's stockpile.

But more people in industry now agree that some action should be taken.

▪ "I know we have to move the metal sometime, but the question is how."

The speaker was a copper sales executive talking about surplus copper in the Defense Production Act stockpile. There's a growing number of industry people who agree. This applies to aluminum as well as copper.

The theme of current thinking has shifted to "How" from "Do we" —in regard to surplus metal in government inventories. It's starting to generate some interesting ideas.

Committee Approach? — "How about an industry committee?" asks a copper executive. "Stock it heavily with the people that sold the metal to DPA in the first place. Let them judge the strength of the market monthly, and sell a tonnage of metal (at market price) that would not upset the market."

"It's an interesting idea," says a government stockpile man. "I've been hearing variations of this lately. It might work. Of course industry would have to be consulted before any major disposal anyhow."

Labor Peace First—Another government spokesman emphasizes that any decision would have to be reserved until there was complete labor peace in any metal involved. "We've sold metal to help fabricators after strikes were settled," he noted. "And we'll probably do it again."

This official suggests an interagency committee entirely within government. "The Commerce Dept. represents U. S. industry," he notes. "And Interior speaks for the miners. Let these people seek advice from their special areas and bring this with them to an interagency group empowered to take action."

A Commerce Dept. representative notes that the metal industry and the congressmen from heavy mining and industrial areas are the major factors that will have to be swung over for any plan to dispose of surplus metal to have a chance. This plan might do it, he says.

Major copper and aluminum producers haven't taken an official stand on moving DPA metal yet, except that it must not upset the market.

Pros and Cons—One executive of a major aluminum producer figures his company would be in favor of any orderly disposal that would keep market balance. He believes the inter-agency idea would be "too hamstrung." He thinks the industry committee proposal might be simple enough to work.

A copper executive doesn't believe the plan would work. He says, "You just aren't going to be able to move the metal without 'disturbing things,' so any plan that aims to do this is doomed to failure." As to minimizing market damage he comments, "It's a guessing game. You'll find out how much damage you did after, not before, you make a move."

British Approach — One source commented that we ought to take a close look at the British method for unloading a surplus.

They give the people who sold it to them a chance to buy it back at the market price. The inference is if they don't it will be dumped on the market. The company usually does because it can dispose of the surplus with more finesse.

This is unlikely to happen in the U. S.

Copper

Most of the industry got ready to go down on strike this week and there were few optimists predicting an early settlement.

The Mine, Mill and Smelter Workers were asking wage increases from 15¢ to 17¢ and additional benefits that would if granted increase labor costs another 30¢.

The industry was in no mood to go along with anything like that and tough negotiating was expected.

Tin prices for the week: Aug. 12 —101.75; Aug. 13—102.00; Aug. 14 — 102.25; Aug. 17 — 102.50; Aug. 18—102.50*.
* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/59
Aluminum ingot	26.00	26.10	8/1/59
Copper (E)	30.00	31.50	7/13/59
Copper (CS)	30.00	29.50	8/7/59
Copper (L)	30.00	31.50	7/13/59
Lead, St. L.	11.00	11.30	8/7/59
Lead, N. Y.	12.00	11.50	8/7/59
Magnesium ingot	38.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	160-160	162-182	8/1/59
Zinc, E. St. L.	11.00	11.50	2/25/59
Zinc, N. Y.	11.00	12.00	2/25/59

ALUMINUM: 99% ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 176.

thermal thicket

Problem: *The heat barrier which now hinders hypersonic aircraft and missiles.*

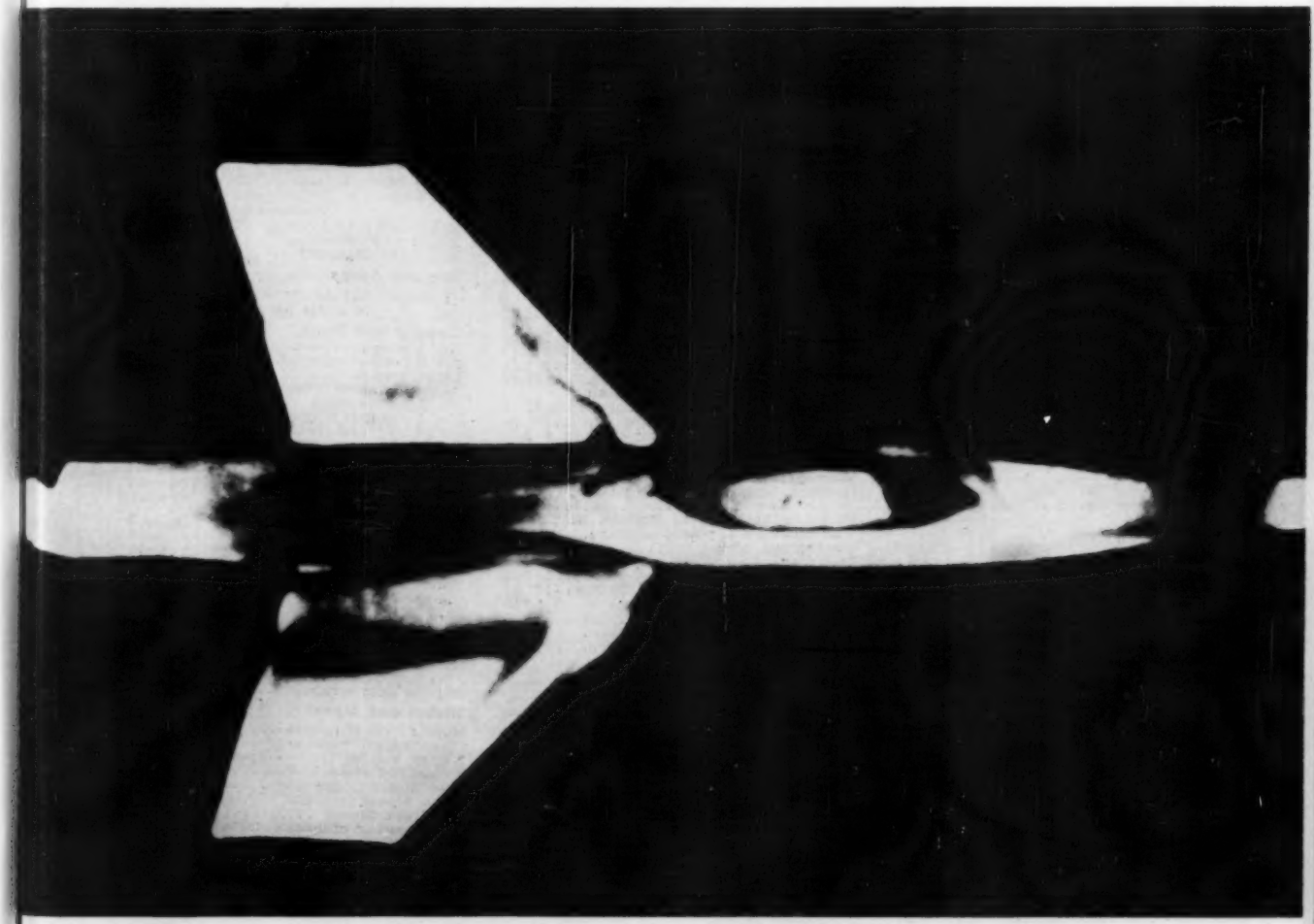
Needed: *Dependable high temperature alloys for structural components.*

Solution: *Find the right alloys that are easy to forge and machine and are truly uniform.*

Source: *Predictable performance Carpenter alloys made by the exclusive Mel-Trol, VacuMeltrol and Consumet melting processes.*

Engine builders find them ideal for many critical parts. Forge shops report improved forgeability resulting in better finishes requiring far less machining. Work goes faster. Rejects are fewer.

Call your local Carpenter Representative for the whole story about predictable performance alloys and how they can benefit you. The Carpenter Steel Company, Reading, Pa.



a new company 70 years old

Carpenter steel

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	54.32
Brass, Yellow	47.24	47.78	47.18	50.65
Brass, Low	50.03	50.57	49.97	51.34
Brass, R L	51.02	51.56	50.96	51.33
Brass, Naval	51.90	.....	45.71	53.31
Munts Metal	49.95	.....	45.26	.....
Comm. Bs.	52.55	53.09	52.49	55.61
Mang. Bs.	55.64	.....	49.30	.....
Phos. Bs. 5%	73.92	.....	74.42	.....

Free Cutting Brass Rod 31.81

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.75-$6.25; alloy, $7.75-$10.00; Bar, HR or forged, commercially pure, $4.25-$5.00; alloy, $4.25-$7.50; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex., 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.30
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb) ... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 33.30 to 42.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz..... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $234 to $236
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz... $18 to $20
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.00
- No. 123 ..... 27.00

80-10-10 ingot
- No. 305 ..... 33.50
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 42.00
- No. 215 ..... 37.75
- No. 245 ..... 33.50

Yellow ingot
- No. 405 ..... 23.75

Manganese bronze
- No. 421 ..... 26.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.00-25.25
- 0.60 copper max. 24.75-25.00

Piston alloys (No. 122 type).. 26.75-27.75
No. 12 alum. (No. 2 grade)... 23.50-24.00
108 alloy 24.00-24.50
195 alloy 26.50-27.50
13 alloy (0.60 copper max.)... 24.75-25.00
AXS-679 (1 pct zinc) 23.75-24.75

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 24.00-25.00
Grade 2—92-95% 22.75-23.75
Grade 3—90-92% 21.75-22.75
Grade 4—85-90% 21.25-22.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¼
Yellow brass	19⅝	17⅝
Red brass	22⅞	22⅛
Comm. bronze	23⅞	23⅛
Mang. bronze	18⅝	17½
Free cutting rod ends.	18⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25⅜
No. 2 copper wire	24¼
Light copper	22
*Refinery brass	23⅜
Copper bearing material	23

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25⅜
No. 2 copper wire	23⅜
Light copper	21⅜
No. 1 composition	21
No. 1 comp. turnings	20½
Hvy. yellow brass solids	15½
Brass pipe	15½
Radiators	16½
Aluminum	
Mixed old cast.	16½—17
Mixed new clips	16 —17
Mixed turnings, dry	14½—15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 copper wire	23¼—23⅜
No. 2 copper wire	21⅜—21⅝
Light copper	19¼—19⅝
Auto radiators (unsweated)	13½—14
No. 1 composition	17⅝—18½
No. 1 composition turnings	16¼—16⅝
Cocks and faucets	13⅝—14½
Clean heavy yellow brass	12¼—12½
Brass pipe	13⅜—14¼
New soft brass clippings	14¼—14⅝
No. 1 brass rod turnings	11½—12
Aluminum	
Alum. pistons and struts	7½— 8
Aluminum crankcase	11¼—11¾
1100 (2s) aluminum clippings	15 —15½
Old sheet and utensils	11¼—11¾
Borings and turnings	7 — 7½
Industrial castings	11¼—11¾
2020 (24S) clippings	12½—13
Zinc	
New zinc clippings	4¾— 5¼
Old zinc	3¼— 3½
Zinc routings	2 — 2¼
Old die cast scrap	1¾— 2
Nickel and Monel	
Pure nickel clippings	52-54
Clean nickel turnings	40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	30-32
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15
Lead	
Soft scrap lead	7½— 7¾
Battery plates (dry)	2¼— 2½
Batteries, acid free	2 — 2¼
Miscellaneous	
Block tin	77 —78
No. 1 pewter	59 —60
Auto babbitt	40 —41
Mixer common babbitt	9¾—10¼
Solder joints	14 —14½
Siphon tops	42
Small foundry type	10¼—10¾
Monotype	10¼—10¾
Lino. and stereotype	9¼— 9¾
Electrotype	7¾— 8¼
Hand picked type shells	6 — 6½
Lino. and stereo. dross	2¾— 3¼
Electro dross	2¾— 3¼

(Effective Aug. 17, 1959)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective Aug. 17, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.			Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*			6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*							
	Coatesville, Pa.													
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*				$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*		6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.										6.70 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*							
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*										
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*				6.40 *A5, R3, W8*			
	Sterling, Ill.										6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*			6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*						
	Newport, Ky.	5.10 *A9*	6.275 *A9*											
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*			6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*							6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*								
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*					$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*		6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*								6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*				$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*			6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*				$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*												
	Kansas City, Mo.										6.65 *S2*			
	Los Angeles, Torrance, Cal.										7.20 *B2*			
	Minnequa, Colo.										6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*							7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*						6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas										6.65 *S2*			

*Electrogalvanized sheets.

(Effective Aug. 17, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875*L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,I3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.80 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Aug. 17, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B.. Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Chicago, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

(Effective Aug. 17, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium..					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 42.50; 1 side, 35.85.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P5*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
Grain Oriented			
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky....	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk...	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective Aug. 17, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails ¢/lb.	Woven Wire Fence ¢/lb.	"T" Fence Posts ¢/lb.	Single Loop Bale Ties ¢/lb.	Galv. Barbed and Twisted Barbless Wire ¢/lb.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3****	173	190	...	...	190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	177	190	172	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	176	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
Sparrows Pt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Chicago	.....	.....	.....	15.60	.....
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders	
Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine ½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1¼" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

C. P. Hex, reg. & hvy.	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41

Semi-finished Hex Nuts	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished	
⅞ in. and smaller	65

Rivets	*Base per 100 lb*
½ in. and larger	$12.85
	Pct. Off List
7/16 in. and smaller	15

Cap Screws	*Discount (Packages)*
	Full Finished H. C. Heat Treat
New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54	42
¾", ⅞", and 1" diam. x 6" and shorter	38	23
⅝" diam. and smaller x longer than 6"	..	..
¾", ⅞", and 1" diam. x longer than 6"	..	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. 25,000-and over	60	..
5/16 to ⅜" diam. incl. 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	46.00
Electrodeposited	37.00
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots	17.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium, 5000 lb	1.20
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*				
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston**	.10	10.52	11.27	11.82	12.17	10.42	10.72	10.34	13.45*	16.79	16.69	20.29	21.04
Buffalo**	.15	9.80	10.50	11.35	11.30	10.25	10.40	9.90	11.60*	16.34	16.45	19.01	20.80
Chicago**	.15	8.69	10.35	11.05	10.35	8.62	9.16	8.79	10.80	16.20	16.10	19.70	20.45
Cincinnati**	.15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68*	16.52	16.42	20.02	20.77
Cleveland**	.15	8.62[1]	9.61	11.02	10.36	8.76	9.63	9.36	11.40*	16.31	16.21	19.81	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit**	.15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	15.46	16.38	18.81	21.03
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles**		9.95[1]	11.55	12.20	11.55	10.00	10.00	9.10	14.20	17.30	16.45	21.30	20.80
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee**	.15	8.83	10.49	11.19	10.49	8.76	9.30	8.93	11.04	16.34	15.34	19.84	19.09
New York**	.10	10.52	10.59	11.40	12.14	10.77	10.84	10.09	13.35*	16.16	16.50	20.10	20.85
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia**	.10	9.55	10.10	10.71	11.75	10.15	10.20	9.50	12.65*	16.58	16.48	20.08	20.83
Pittsburgh**	.15	8.62	9.61	10.95	10.36	8.52	9.24	8.62	11.40*	16.20	16.10	19.70	20.45
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30*	18.50	17.45	20.75	20.25
San Francisco**	.10	11.00	11.95[2]	11.50	12.25	11.00	10.95	10.75	15.20	17.65	16.35	21.65	20.60
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	17.15	17.80	20.65	22.20
Spokane**	.15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	17.95	21.55	22.35
St. Louis**	.15	9.07	10.73	11.02	10.73	9.00	9.76	9.17	11.43	16.58	16.48	20.08	19.33
St. Paul	.15	8.94	9.31	10.47	8.99	9.45	9.53	9.70	11.49		15.41		20.83

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; * C 1018—1" rounds.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter.

(Effective Aug. 17, 1959)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.00	68.40	68.00	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

(Ferroalloy prices will next appear in the Aug. 27 issue.)

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

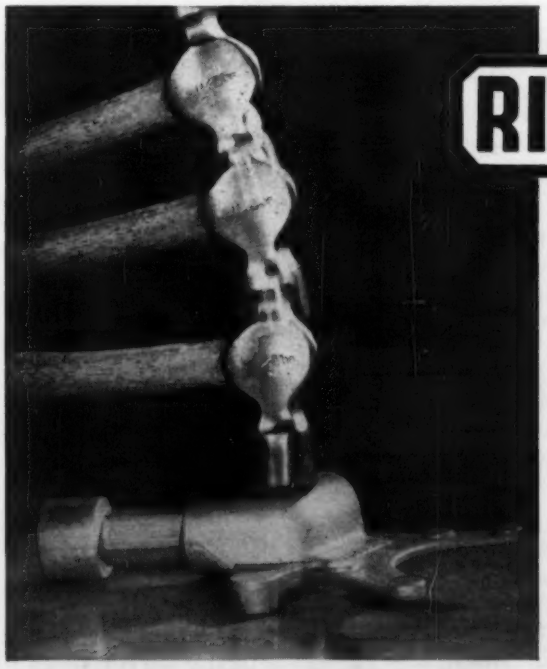
Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

(Effective Aug. 17, 1959)



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Toughness to shock and stress is just one of the many features found in Ritco Forgings. While their dense, fibrous structure and controlled grain flow assure maximum impact resistance and fatigue strength, their smooth, highly accurate surfaces speed up assembly time, save hours of time and trouble. Made to close tolerance specifications, these finer forgings enable you to hold machining to a minimum . . . keep production costs down.

Plan to write Ritco into your product specifications the next time you need forgings. Made in a wide range of metals and alloys, and in many designs.

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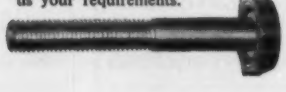

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ELECTRICAL POWER EQUIPMENT IN STOCK

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New Elliott	Enc. F.V.	475	330
1	3000	New Whse.	Enc. F.V.	525	600
1	2250	New Elliott	Enc. F.V.	600	200/300
1	2200	G.E.	stCr	600	400/500
1	1750	New Elliott	Enc. F.V.	250	175/350
8	1500	New Whse.	Enc. F.V.	525	600
1	1300	G.E.	MCF-12	300	200/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
1	940	Whse.	QM	250	140/170
2	940	S.S.	Enc. F.V.	600	800/1000
2	800	G.E.	MCF	250	400/750
2	765	Allis. Ch.	MHC	550	1012/1350
2	750	G.E.	MCF	600	450/900
1	750	G.E.	M.F.	600	120/360
4	600	Whse.		250	275/550
1	500	G.E.	MPC-10	250	188/400
2	450	Whse.		550	415
2	400	G.E.	CY-275	300	1000/1500
2	325	Allis Ch.	MHC	250	450/900
1	300	Cr. Wh.	H-102 B.B.	230	1200
1	200	Rel. B.B.	T-664-D.P.	240	850
1	200	Whse.	CB-207-4	250	850/1200
1	150	Cr. Wh.	CMC-65H	230	1150
1	150	G.E.B.B.	TLC-74	250	1150/3500
1	150	G.E.B.B.	CD	600	250/750
1	150	G.E.	CDP-125, B.B.	230	1750
1	150	A.C.	E.V.B.B.	250	450/1200
1	120	G.E.B.B.	TLC-50	250	1950/5000
1	120	Rel. B.B.	1050T	230	575/900
2	125	Whse.	SK-190	230	450/1200
1	100	G.E.	CDP-145	230	1750
1	80	Whse.	SK-123.9	240	2000/4500
1	75	G.E.B.B.	CD-1235-D.P.	600	850
1	60/75	Rel.	1050T	250	350/1050
1	30/40	Whse. B.B.	SK-131, TEFC	250	500/1500
1	25/33	Rel. B.B.	TY563	240	300/1200
1	40	Rel. B.B.	385F, TEFC	250	500/1500
1	30/40	Rel. B.B.	T-564-D.P.	240	300/900

MERCURY ARC RECTIFIERS

3—150 KW, G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.
2—150 KW, G.E., Ignitron, 245 V. D.C.—230 V. A.C. air cooler transformers with controls.

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1750	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	Cr.Wh. 4 unit	720	100	2300
1	500	G.E.	900	125/250	440
1	500	G.E.	900	250	2300/4600
1	350	G.E.	900	125	440/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	250	G.E.	900	250	440/2300
1	240	Whse.	900	125	220/440
1	200	Whse.	1200	550	2200
1	200	El.Mhy.	1200	250	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	250	440
1	150	G.E.	1200	125	440
1	140	Cr.Wh.	690	125/250	2300
1	100	G.E.	1170	250	220/440
2	100	Cr.Wh.	81160	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
2	3333	Whse.	OISC	1	13800 x 2300
2	1000	G.E.	CA/FA	1	13800 x 230/460
3	833	A.C.	OISC	1	4800/2400 x 480
1	750	Wagner	JPC-16	3	13200 x 480
2	750	G.E.	Pyranol	1	4800x85/55-255/165
3	500	Kuhl	OISC	1	13200 x 6600
6	333	G.E.	HS	1	7200/12470YX 2400/4160Y
2	333	G.E.	OISC	2	2400/4160YX600
3	150	G.E.	OISC	1	23000x2300/4000Y
3	100	G.E.	HS	1	4800/8320Y x 120/240

CRANE & MILL MOTORS
230 V. D. C.

Qu.	H.P.	Make	RPM	Type
12	12/14	Whse.	700/600	MCA-30, Series
1	20	Whse.	975	K-5 Series
2	23	G.E.	650	MDS-408
1	25	Whse.	480	CK-9 Comp. S.B.
1	35	Whse.	480	CK-9 Sh. R.B.
3	45	Whse.	600	CK-9 Comp. S.B.
2	50	G.E.	650	COM-1830 Comp.
2	50	Whse.	525	CK-9 Shunt. R.B.
2	50	Whse.	600	CK-9 Comp. R.B.
1	50	G.E.	525	COM-1830AEB.B.
1	50	Cr.Wh.	550	SW-50 Comp.
1	100	G.E.	475	CO-1832 S.B.
8	100-140	Whse.	500/415	MC-90 R.B.

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Brisk Business Pace Continues in West

Used machinery dealers in the Farwest find overall volume not hurt by present temporary business setbacks.

■ Nothing slows down the quick pace of West Coast used machinery business. Neither steel strikes, nor plant vacations, nor the ups-and-downs of military contracts.

Explosive population growth in the Farwest assures new and growing demand for consumer products. This nicely offsets the peaks and valleys of defense business.

Defense Work Lull—Right now, used machinery dealers in southern California report a lull in plants doing military work. Several huge contracts haven't yet worked their way down to third and fourth tier subcontractors.

Machinery dealers are sitting with this type of equipment just waiting for sales: Duplex horizontal mills, multi-spindle drills, 25 in. to 30 in. swing lathes with short centers.

Others Active—Picking up the slack is the brisk demand for used machinery from makers of outboard motors, water heaters, and air conditioning equipment.

A big order for machinery from a firm making processing equipment for the metal mining industry improved the market. This company is expanding its Latin American market and equipping a plant to produce there.

What's Wanted—What do dealers in southern California need most? Sheet metal machinery heads the list. They're on the lookout for late-model, good-condition press brakes, and big shears.

The business pickup enjoyed last month in the used machinery business in northern California continues. And with some dealers it's better than ever.

One dealer, riding especially high, says his volume is "almost triple" what it was a year ago at this time.

All dealers said business would be still better if they could get all the equipment in demand. Standard items — lathes, milling machines, drills—collect no dust. Drill presses and punch presses up to 100 tons are scarce as hens' teeth, one dealer reports.

Travel East?—Though some said they are going back East to fill their needs, most find this quite risky. The expense of sending a man East, plus the freight, makes it too costly.

What about foreign machines? The hit-and-run importers who brought in anything are pretty well out of the picture. Those left in the business are reliable, bring in only quality merchandise, and stand behind the products.

Coming Auction

Machinery and equipment valued at $4 million will be sold at auction on August 24 through August 28 at the Fairchild Engine Div. of Fairchild Airplane Corp. on Comac Road, Deer Park, Long Island.

Sale will be conducted by the Industrial Plants Corp.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10 Ga. Bertsch No. 6 Initial Type
8' x ⅛" Bertsch Initial Type
12' x ¼" Bertsch initial Type
32' x ⅜" BALDWIN PYRAMID TYPE—Late
BRAKE—BOX & PAN
8' x ¼" Dreis & Krump, 12" Finger Extension
BRAKES—PRESS TYPE
90 ton Niagara, Model 90-8-10
16' x 10 Ga. Clearing
CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	40' Span 220 Volt D.C.
10 ton P&H	55' Span 230/3/60
10 ton P&H	39' Span 230 Volt D.C.
10 ton Milwaukee	57' Span 230 Volt D.C.
10 ton Shaw	48' Span-230 Volt D.C.
10 ton Whiting	75' Span 220/3/60 A.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Milwaukee	56' Span-440/3/60 A.C.
5 ton Aux	Arr. for Magnet Opr.
15 ton Shepard Niles With 5 ton Auxiliary	55' 6" Span 220/3/60
20 ton P&H With 5 ton Auxiliary	57' 6" Span 220/3/60
30 ton Shaw	70' Span 230 Volt D.C.
120 ton Niles	67' Span 230 Volt D.C.
120 ton Shepard Niles	77' Span 220/3/60 A.C.

DRAW BENCHES
7,000 lb. Draw Bench, 51 ft. Draw
10,000 lb. Draw Bench, 50 ft. Draw
35,000 lb. Draw Bench, 41 ft. Draw
FORGING MACHINES
1" to 5" Acme, Ajax, National
HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.
HEADERS
#250C Manville Single Stroke Solid Die
#4 Waterbury Farrel Dble. Str. Open Die
⅝" National DS8D Header, with 1" National Hydr. Straightener & #4 Ajax-Hogue Wire Drawer
LEVELERS—ROLLERS
24" Torrington 9 Rolls 8" Dia.
50" Youngstown Processor & Leveler, Capy. .100"
60" Guide 17 Rolls 4⅜" Dia.
7½ Leveler 17 Rolls 2⅝" Backed Up
LEVELER—STRETCHER
100 ton Hydraulic Stretcher Leveler
NIBBLER
Pullmax Model 2, Capacity 11/32"
PRESSES—HYDRAULIC
300 ton Southwark Platen 28" x 28", Stroke 25"
500 ton HPM 4-Col. Bed Area 36"x36", Stroke 24"
500 ton Watson Stillman Piercing Press, 48" x 72"
1000 ton Southwark Bed 44" x 54", Stroke 20"
4500 ton B-L-H Bed 68" x 68", Stroke 40"
PUNCH & SHEAR COMBINATIONS
#2½ Buffalo Ironworker
Style EF Cleveland 42" Throat, Plain Jaw
Style EF Cleveland 60" Throat, Plain Jaw
ROLLING MILLS
3½" x 7" Six Cluster Mill
10" x 14" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Two Stand Two High
20" x 36" Single Stand Two High
26" x 60" Single Stand Two High
12" x 32" Birdsboro 3-Hi Bar Mill
22" x 40" Lewis 3-Hi Sheet Mill
22" x 84" Single Stand Three High
34" x 112" Single Stand Three High
ROLLS—PLATE STRAIGHTENING
72" McKay 9 Rolls 15" Dia. Backed-up
92" Hilles & Jones, 6 Rolls 10" Dia.
SCALPING OR BILLET PEELING MACHINE
Medart #6 Size HFBP, Capacity, 3⅛" to 5" Incl.
SHEAR—BAR
#4½ United Vertical Bar Shear R H
SHEARS, MISC.
36" Hallden Shear Line Drum Type, Capy. 33-38 Ga.
60" x 10 Ga. Cut-off Line
96" x 14 Ga. Cut-off Line
SHEAR—ROTARY
No. 23A Quickwork Whiting 3/16" Capacity
No. 40A Quickwork Whiting ⅛" Capacity
SHEARS—SQUARING
8' x 14 Ga. Edwards, Motor Drive—LATE
10' x ⅜" United
10' x ¼" Niagara No. 910
6' x ⅛" Cincinnati
8' x ⅛" Bertsch
SLITTERS
36" Waterbury Farrel, Slitting Line, Arbor 4⅛" Dia.
36" Wean Slitting Line, Arbor 5" Dia.
STRAIGHTENERS
Torrington #1734 12-Roll, Capy. 1⅜", Rd. 1-9/16"
⅝" Medart Straightening & Cut-off Machine 20 ft. Cut-off
SWAGING MACHINE
#6½A Fenn 2-Die, Capacity 3¾" Tube, 1¼" Solid 10" Die Length, Hydraulic Feed
TESTING MACHINES
20,000 lb. Baldwin Univ. Hydraulic
50,000 lb. Olsen 3-Screw Beam Type Universal
60,000 lb. B-L-H Hydraulic Universal
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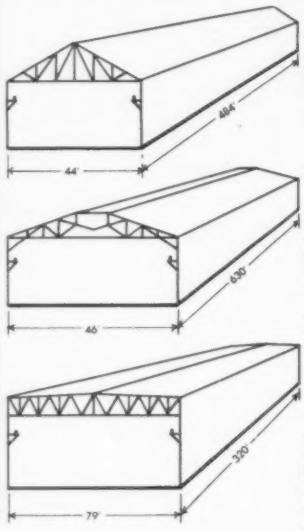

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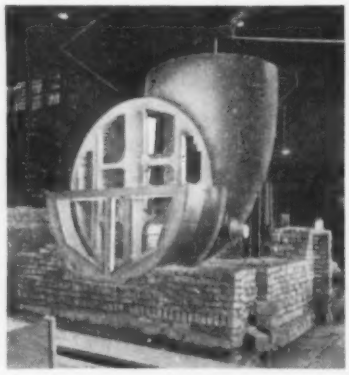

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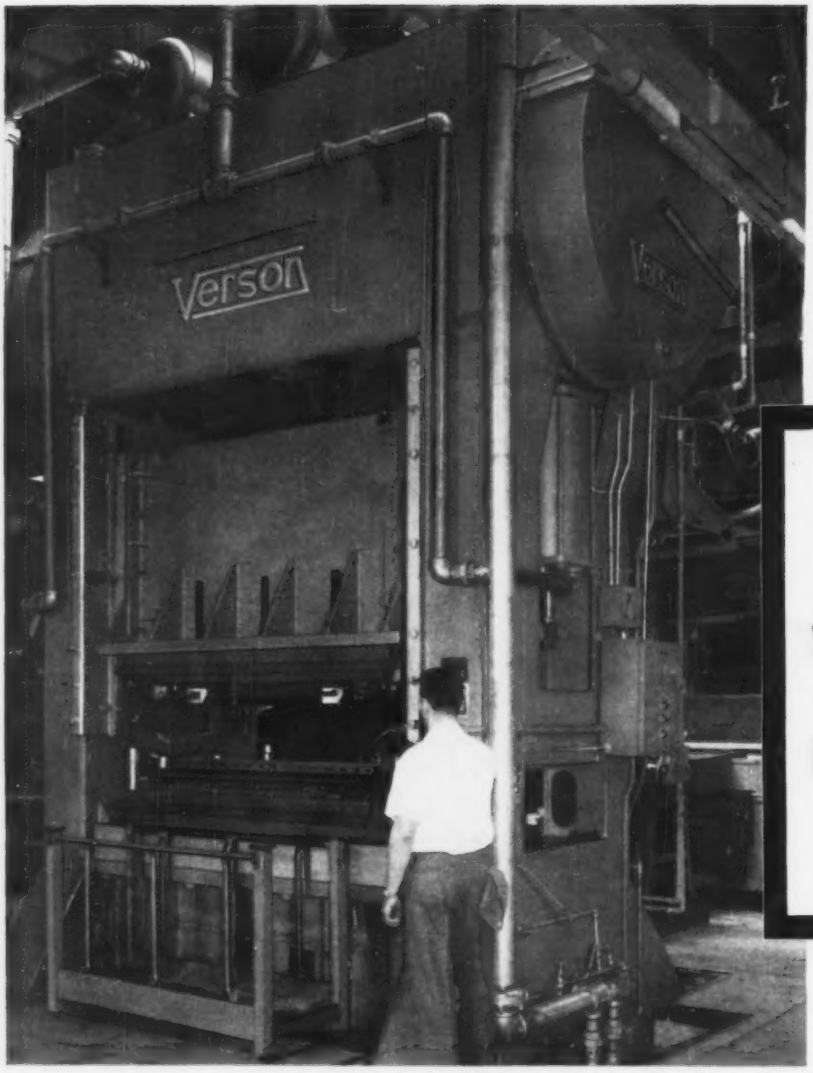

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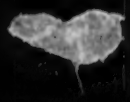
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